

Kent scheme widens adult opportunity

by Sue Reid

Kent University's newly inaugurated School of Continuing Education is hoping to obtain Privy Council approval for a plan to offer part-time undergraduate degree courses. If successful, Kent will be one of the first universities in the country to implement such a scheme.

The school, officially inaugurated last week, took over responsibility for university adult education in Kent from the University of Oxford last August. It now intends to expand adult education throughout the county and introduce the part-time first degree courses within the next few years.

Kent University court has already agreed a change in the university statutes to allow the introduction of part-time undergraduate courses but Privy Council approval is still awaited.

A consultative committee, including representatives from the Kent Education Authority, the Workers' Educational Association and industry, set up under the chairmanship of Professor Maurice Vile, pro vice-chancellor of the university, to help establish close links between the new school and the county community.

At the committee's inaugural meeting Dr Alec Barbrook, Direc-

tor of the School of Continuing Education said in a special report that the comparative success of the Open University had indicated that a similar scheme for part-time degree work but it was likely that the Open University had only attracted highly dedicated people who were prepared to work largely via correspondence courses.

He added: "Given some system of face to face teaching, we feel that we could attract good mature students into courses leading to part-time degrees, not in enormous numbers but in a quantity sufficient for us to make it a worthwhile project."

The school's first venture will be a two-year part-time MA in management organized in conjunction with the university's faculty of social sciences and introduced this October.

If the Privy Council does give its approval, Dr Barbrook and his five full-time staff hope to offer a part-time undergraduate degree in European languages within the next few years followed in the future by other courses, including one, possibly, in natural sciences.

Meanwhile, the school is responsible for a wide range of programmes throughout Kent. In winter the school, with the help of part-time tutors, has staged about 80 classes in Kent's major towns.

Lender, page 14

Need for engineers prompts 'end free choice' suggestion

by Frances Hill

Students in higher education should not be allowed a "free market" choice of subject, Mr Jeff Rooker, MP for Perry Barr, in Birmingham said last week.

Deploping the nation's severe shortage of qualified engineers, Mr Rooker suggested that a positive approach was required to bring more students into subjects like engineering. "How we go about this is a thorny problem but one we must face sooner rather than later."

The wholesale creation of universities in the 1960s did not lead to the desired evenness in the number of students in engineering and technology. Mr Rooker said. The polytechnics had also failed to perform this role.

Only 10,200 first degrees were awarded in engineering/technology in 1972/73, out of a total of 64,000 bachelor's degrees. Only 249 degrees were awarded in production engineering, from 12 universities and six polytechnics.

The failure of the polytechnics in technology was hardly surprising, given the attitude expressed by the chairman of governors of Birmingham Polytechnic, Mr Rooker said. The chairman, Mr William Kendrick, has been quoted as saying that his students were second class and that the school was to be NCOs rather than officers. "This attitude ought to be sufficient grounds for his removal from office," Mr Rooker added.

A recent study for the West Midlands Economic Planning Council showed that only 25 per cent of the 100,000 people in the region were employed in engineering and technology. The study also showed that only 16 per cent of the population were employed in engineering and technology. This suggested "a situation crying out for more production engineering."

A single body with responsibility for examining the question of technological manpower resources and needs as a whole was urgently needed, he claimed.

Change foreseen in way pay negotiated

One of the effects of the public expenditure White Paper on universities could be to change the way academic salaries were negotiated. Sir Alec Morrison, vice-chancellor of Bristol University, told Senate recently.

He said there was little justification for continuing the present complex negotiating procedure if the Government's new ideas on cash limits covered universities.

The Association of University Teachers recently decided to press for direct negotiation with the Department of Education and Science, abolishing the stage of negotiating separately with the university authorities.

At the Senate meeting Sir Alec heard comments on his proposals for alleviating the consequences of a "steady" state of finances and a "steady" state of student numbers. His idea for a visiting scholars fund at Bristol was welcomed.

Make courses more attractive—Bondi

University courses need to be modified with the aid of market research to make them more attractive to those they want to attract. Intelligent, ambitious youngsters with a will to learn.

Professor Hermann Bondi, chief scientific adviser to the Ministry of Defence and professor of mathematics at King's College London, makes this recommendation in an article on mathematics education this week.

He also calls for a strong Science Research Council policy of actively discouraging students from remaining in the department where they received their first degree. Free movement of postgraduates between departments felt that what it could do at research level was determined by what it offered to undergraduates.

Bondi article, page 8

48 posts cut in London reorganization

by David Illecock

The Inner London Education Authority is to declare 48 full-time teaching posts "surplus to requirements" at the end of next academic year, as the first stage of the rationalization of colleges of education.

Abolition of the posts will reduce the number of full-time teaching staff in the colleges from 620 to 572. Further reductions are expected in the following two years.

Avery Hill College of Education, which is planning to close its Mile End Annex for mature students, will be the most seriously affected initially; 22 lecturers have been asked to leave following abolition of posts, including part-time posts.

Eighteen of them are looking for employment within the authority. In other colleges many temporary part-time posts are being abolished, causing redundancies.

A spokesman for ILEA said the authority had drawn up a consultation document to cover lecturers whose posts were to be abolished. In most cases more than one year's notice will be given and generous periods of study leave will be allowed for retraining. Lecturers could expect to be redeployed by the authority, possibly in schools.

Colleges have been given a choice on how to introduce rationalization of posts. They can opt to abolish part-time posts first or decide to phase plans for one year if they wish to introduce large-scale changes later. Negotiations have begun between the authority and the colleges on the numbers of staff required in 1978.

Between 28 and 40 lecturers can expect to lose their jobs at New College Polytechnic and Northern Counties College of Education by the end of the year. Newcastle education authority has stated it requires 101 redundancies between now and 1978 following the merger of the college and polytechnic.

Local authority proposals geared to a 1:10 staff:student ratio have caused considerable concern at both institutions since the authority requires names of suitable staff to be declared redundant before the end of the year.

There will be no redundancies at Alnwick College of Education, Northumberland, which faces possible closure in 1977.

Miss Lilian Holmby, principal of the college, said that all the staff had so far been able to find suitable redeployment or been able to retire. The college was still hoping that a plan to offer courses for overseas students can keep it open after 1977.

Lift up your voices

Academic voices are to join to give harmony at a festival at Warwick University in April. Choirs from Sweden, Hungary and Poland will join three British university choirs for an international university choir festival being mounted by Warwick with British Council assistance.

The festival will be a celebration of the university's 50th anniversary. It will be held in the main hall of the university and will feature a variety of musical performances.

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Three tier system announced for business qualifications

The Business Education Council has formally outlined its plan to introduce a new national range of courses and awards in Britain's polytechnics and colleges of further education from next year.

In a policy statement this week, drawn up after nearly two years of detailed consultation with the colleges, industry, training boards and professional bodies, the council unveiled a three-tier award structure specifically catering for business and public administration students.

The council was set up by the Department of Education and Science in 1974 with a brief to establish and monitor a unified national system of non-degree courses in the business and public administration fields.

The new BEC awards will supersede the various certificates in distribution and office studies offered in colleges of further education and the ordinary and higher national certificates and diplomas in business studies and public administration first introduced 10 years ago.

The three levels of BEC award will be the general certificate and diploma, requiring no entry requirements; the BEC national certificate and diploma, equivalent to the present OND qualification; and the BEC higher national certificate and diploma, similar to the HND.

BEC hopes that the national certificate and diploma will be accepted as an entry qualification to the dip-

loma in higher education course or a degree course, and be recognized by various professional bodies. The higher national certificate and diploma should, the council said, give recognition to the transfer and allow students to transfer in certain cases to degree courses and gain exemptions from professional examinations.

An unusual feature of the new BEC structure is the variety of methods available, enabling courses to be taken on a full-time, part-time, block release or sandwich basis at all the levels. The council also intends to experiment with the use of private study and correspondence courses perhaps with the help of television and radio networks.

The BEC aims to introduce its first courses at the beginning of the 1977 academic session and will expand the range from September 1978, while gradually phasing out the present non-degree business studies and awards and diplomas.

The BEC already has 75,000 students throughout the country on degree business courses, of which 50,000 were studying part-time. They were, he added, taking a wide range of courses but the BEC would stop this proliferation of certificates and diplomas and introduce a standard award system.

The council, which has received a grant from the DES over the past two years to cover deficits, plans to become completely self-sufficient within five years. During the next year it will receive £300,000 in examination fees but will need DES assistance until its courses are fully developed.

Better use of educational technology urged

Educational technology should be used to increase the cost-effectiveness of education in a time of economic stringency, the Council for Educational Technology recommended last week.

The council said educational technology could play a significant part in improving the quality of the educational service in helping to provide growth and development by the better utilization of resources currently available.

"Too often in the past educational technology has been an add-on cost," something extra, such as closed-circuit television, which adds to the resources backing teaching but provides no offsetting reductions in other costs."

A marginal redistribution of finance, particularly towards investment in retraining staff to make better use of resources, could be highly cost-effective, the CET said. Teachers should be treated as the most important and flexible resource.

The broadcasters and the Open University should continue to expand their activities in updating teachers and trainers in the concepts and techniques of curriculum development and educational technology. This is especially important in a period when opportunities for more direct training are being limited."

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Cambridge rejects plan to declassify trips

Cambridge academics have rejected a proposal to abolish classification in degree examinations.

By a majority of nearly 300, the university has thrown out a move by the faculty of economics to "declassify" examinations for part one of the economics and politics trips.

Opposition to the scheme was strong among historians and geographers while its supporters, including Mrs Joan Robinson and Professor Piero Sraffa, were mainly from teachers of economics and social and political sciences.

In a fly-sheet, circulated before their ballot in some form of academic assessment. "Classing has positive virtues, such as the due acknowledgement of academic work of quality. One of the merits of the Cambridge trips system is that all candidates are classed at least twice in trips examinations. This frequently permits a more accurate assessment of an undergraduate than does a single classing in a first examination."

The supporters of the proposals said it was an experiment fully endorsed by the economics faculty which should not be stopped because of the fear of repercussions within other subjects.

Lord Ashby, page 5

Halt anti-technical trend, Sir Alex says

by David Hencke

The onsets for Britain's economic recovery will remain bleak unless the trend towards graduate courses at the expense of technicians qualifications is halted, Sir Alex Smith, chairman of the Committee of Directors of Polytechnics, warned this week.

He said at Bristol Polytechnic that the lack of esteem given to skills in designing and manufacturing, compared with academic scholarship and research, was creating two cultures.

He warned that this "not a very edifying or a very stable division" was leading to an "evolutionary period of social decline which calls out for an adaptive response."

He said: "Education has become synonymous with mainly scholastic attributes, and has relegated to an inferior role the rest of the human abilities to be developed. It is too narrow, confining interpretation of the concept of education."

"The country now has a surfeit of the development of analytical and theoretical abilities and of capacity for social commentary, but an acute shortage of people who can design and manufacture abilities."

Sir Alex was giving the first Holland Memorial Lecture, in honour of the late Dr Robert Holland, a former director of Bristol Polytechnic.



Sir Alex Smith

He began his lecture with an analysis of Britain which he said seemed to be in a persistently stagnant state. "There is something very imbalanced about a social system which is capable of designing and building a Concorde yet which has to go to Germany, Switzerland or Japan to buy the machine tools to equip its factories."

On education expenditure he said that decline in spending was indicative of a sense of disillusionment with education mirroring a generally held feeling of doubt about the performance of the education service.

Feature next week

Critics attack new school leavers project

The Government's plan for 10 pilot project courses to help young people move from school to work was heavily criticized at a conference in London this week.

The projects were given the go-ahead on Tuesday by Mr Mulley, the Secretary of State for Education, when he opened a conference arranged by the Department of Education and Science on the 300,000 young people who set no further education or training when they leave school.

Working papers issued before the conference suggested that initially 300 students a year should take the proposed courses, rising to 1,000 a year after five years.

Though Mr Mulley indicated there would be no money specifically for the projects, many speakers criticized him for announcing such a small experiment over so long a period of time.

Britain increases aid to black Rhodesian students

by Douglas Morrison

The Ministry of Overseas Development is to increase its aid to black students at the University of Rhodesia by up to £50,000.

This will bring Britain's total spending on supporting black Rhodesians at the university in Salisbury to about £230,000. The figure is expected to rise to between £350,000 to £400,000.

The extra £90,000 will be used to finance black students in places that would have gone to whites who, because of the increasing need for military manpower, have had deferment of army training cancelled.

Only those whites qualified for university entrance who have completed their basic army training or who are medically unfit for active service will be able to take up places.

This means that up to 100 places have been reserved for black students for World University Service said this week. The WUS office in Salisbury, coordinated the effort to raise extra funds.

The ODM agreed to guarantee finance for up to 100 places. The WUS anticipated that between 70-80 would be taken up and of those 10 each would be supported by Canada and Denmark. ODM support for black students at the University of Rhodesia last year reached £52,000 and was due to be between £120,000-£130,000 this year.

The increased black intake means that for the first time blacks will outnumber white students. Last year there were 334 whites (208 men, 126 women) and 304 blacks; this year there will be 244 whites (124 men, 120 women) and more than 384 blacks.

Distortion of purposes feared

from page 1

are increasingly going to have to go into remedial work in these fields."

Sir Frederick went on to say his remarks should not be taken as criticism of schools. One problem was the shortage of well qualified science and mathematics teachers.

In an uncompromising statement, the UGC says that it neither has nor seeks control over the universities. While it argues that it must influence the shape of growth of the university system, it rejects the idea that it is merely transmitting a centrally conceived plan.

In the year under survey there were 250,565 full-time students in the universities (a growth of 2.7 per cent over the previous year) and 31,338 members of full-time teaching and research staff. Between

should be raised so that they could pay economic charges.

The survey says that no work is in progress in the committees on the universities' outline plans for growth, because of uncertainty over student numbers. "It would be pointless to attempt to determine revised longer-term planning targets for individual universities."

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In the year under survey there were 250,565 full-time students in the universities (a growth of 2.7 per cent over the previous year) and 31,338 members of full-time teaching and research staff. Between

1973-74 and 1974-75 there was an overall growth of 658 members of staff, although staff numbers declined at nine universities.

Although the development of medical education has been cushioned against the full effects of inflation, the survey says it is unlikely the national target for intake to medical school will be met, chiefly through likely delays in the hospital building programme.

1974-75 there was an annual intake of 450 medical students.

The survey shows that universities reduced their real costs over two years of inflation by about 8 per cent. Table (1) shows how the original grant for 1974-75 (£276m) at 1971 prices became nearly £413m as a result of adjustments and transfers and table (2) shows the overall scale of university finance in 1973-74.

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Overseas students 'take British medics' places'

by Sue Reid

Medical education for British applicants could be expanded if fewer overseas students entered medical schools in this country, Dr John Ellis, dean of the London Hospital Medical School, claimed this week.

Speaking at a conference on admissions to higher education organized by the National Institute for Careers Education and Counselling in Oxford, Dr Ellis said that in 1974 more than 9 per cent of all applications through the Universities Central Council for Admissions had been for overseas students.

Of the 13,000 who applied in 1975, including 2,000 overseas students, only 3,500 gained places.

The biggest problem in medical education was how to deal with the applications. In spite of the rapid expansion since 1959, when only 1,500 places were available, there were still only 3,500 medical school places, although a more rapid expansion could have led to deteriorating standards, Dr Ellis warned.

Outlining the drop in the proportion of overseas medical students in the past 15 years, he said: "This tendency to take fewer overseas students into medicine is sad and serious. It is made all the worse by the fact that in 1959 quite a high proportion of places went to people from overseas."

"One of the ways we could expand our medical education for British-born applicants is by reducing the number of places coming from overseas."

Most medical schools, said Dr Ellis, now took the attitude that they should always try to keep a few places for overseas applicants, but they have preference to people from countries, preferably in the Commonwealth, where there was little or no medical education.

At the London Hospital Medical School preference was given to applicants from Cyprus, Sierra Leone and Cambodia, but students were not accepted from India, Pakistan or the United States. This policy had made a much bigger difference than people realized because in the past very large numbers of Norwegians and quite a large number of Canadians had studied at Britain's medical schools.

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Mr Mulley in calm talks at Warwick

Mr Mulley, Secretary of State for Education and Science, spent a day at Warwick University last week, at the joint invitation of the president of the students' union and the University vice-chancellor, Mr John Butterworth.

The unusual nature of the invitation meant that there were no banner-waving student demonstrators or angry scenes awaiting the education secretary. Instead, Mr Mulley met student leaders and members of the academic staff for a working lunch and later for talks on what he described afterwards as a "calm and reasonable atmosphere".

During an hour-long session with Mr Mulley, members of the students' union expressed their concern of the long-term effects of educational cutbacks.

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Media foster hostility to science, report says

by John Ross

Misrepresentation of science in the media is more harmful than errors of fact, a study group of the British Association for the Advancement of Science has concluded.

Their report, *Science and the Media*, published last week, said: "Articles and programmes are not merely passive reflections of the public's beliefs; they also influence those beliefs. Because some journalists suppose the public is becoming hostile to science, their articles reflect this and, in the end, help to foster such hostility."

"It is not clear how widespread the misconceptions about science are. There are plenty of examples, such as people who 'want to take chemicals out of food'; and there are sufficient indications to give cause for concern, not just about science, but about the entire educational process."

Scientific illiteracy was probably far more widespread than had been assumed and much of the material produced by the media was not calculated to reduce public misconceptions about science.

The report recommended that journalists should be careful not to overstate scientific facts, particularly in sensitive areas such as progress on the cure of diseases.

The report made several recommendations:

- Scientific institutions should encourage journalists to visit them regularly and take part in their conferences.
- Scientific institutions should arrange short conferences, specifically designed for the media, to discuss problems of converting scientific information into newspaper articles or broadcast programmes.
- A similar scheme to the American "Mass Media Intern Program", in which graduate students are encouraged to work for a few months in the mass media, could be tried in this country.
- Consideration should be given to the study of what the general public knows and thinks about science, and from where it gets its information.

Presenting the report last week, Sir Alan Cottrell, Master of Jesus College, Cambridge, and chairman of the study group, said that the attitude of some editors to science was "not as sympathetic and interested as it might always be". Scientists themselves were not always helpful to the media.

Copies of the report may be obtained from The British Association, Fortess House, Seville Row, London W1X 1AB. 50p post free (40p to members).

Leader, page 14

Training programme 'helps' jobless find second careers'

The Government's Training Opportunities Scheme (TOS) is improving many redundant people's chances of employment, Mr Harold Walker, parliamentary under-secretary of state for employment, said last week.

Presenting management diplomas at the Buckinghamshire College of Higher Education, he said the new course of the TOS had already given some of the students, sponsored under the TOS scheme, second careers, including an executive made redundant by the Court Line collapse.

"The value of a skill is undiminished at any time and whatever the state of the economy. It is, however, very much more difficult to convince people of the value of training at a time of rising unemployment."

"But this is the time when we must not just maintain existing training levels but must actually seek to increase them. Neither industry nor Government must fail prey

to the temptation to extend their economic measures to cutbacks in the training commitment."

It was imperative that industry had adequate manpower ready for the upturn in the economy, Mr Walker said. The Government would rather pay people to retrain than pay unemployment benefits.

People with specialized experience who have come to an abrupt end of their careers have a second chance, he added. "Through taking this training opportunity they have used a fallow time in their lives and turned themselves into a more marketable commodity."

"Training is not a mere empty promise in politically difficult times. Training for a skill holds out a very real prospect both in the short and long terms of getting individuals and the country's economy back on their feet."

All subjects are relevant, Reading v-c suggests

by Sue Reid

Any university subject has educational value in its own right and can be used in a wide range of employment, Dr H. R. Pitt, vice-chancellor of Reading University said recently.

In a statement to the annual meeting of the university group Dr Pitt said that the present purpose of qualified people from universities was to meet the needs of the professions. The solution he added, was already familiar to those involved in careers advisory services.

"They have long been familiar with the principle that an historian or a classics graduate sees nothing strange in moving into fields in which his particular university work is not immediately appropriate, and it is particularly encouraging that this idea is now gaining acceptance over a much wider field."

This loosening of the association between a degree course and future

employment was also consistent with the growing belief in continuing education and changes of employment patterns through a person's lifetime.

Dr Pitt said the levelling off in student numbers did not correspond to a steady state in the appointment and tenure of academic staff.

"The present age distribution of university staff both in Britain and abroad is quite abnormal, with a preponderance of younger scholars, whose prospects of promotion and mobility are markedly inferior to what they could normally expect."

Dr Pitt outlined the imbalance between demand for places in some subjects and the number of places available. At Reading more students could be admitted to science courses at relatively little extra cost while the greatest demand for places still came mainly in arts and social sciences where resources were already fully stretched.

AUT urges £11 allowance for travelling lecturers

Academics travelling away from home to conferences or on university business should be entitled to at least £11 a night subsistence allowance, the Association of University Teachers has urged.

In a circular to local associations the AUT has suggested there should be negotiations with individual university authorities on paying lecturers' expenses, mileage allowances and maternity benefits at roughly the same level as civil servants.

Academics would be entitled to first-class rail travel, tourist-class air travel and a day subsistence allowance of nearly £2.

For mileage allowances the AUT urges that the minimum rates be those adopted by the National Joint Council for Local Government white collar staff. Under these a

casual car user would get from 10p to 13.5p per mile depending on the size of his vehicle. He might be entitled to a fixed running charge including licence, insurance and servicing.

The AUT's policy on maternity leave is for 18 weeks with full pay. At present only eight universities have accepted this and a dozen others give over 12 weeks' leave. In local government 18 weeks is usual although 14 are at half-pay.

The circular said: "Some universities may take the view that a revision in maternity leave is not possible at the present time because of the Government's counter-inflation policy. This point should be made, however, that there is nothing to stop negotiations for implementation as soon as Government policy allows."

'Advertising for fellows pays'

Cambridge colleges should openly advertise fellowships instead of relying on "semi-closed recruitment", according to Professor Jack Goody, one of the university's senior anthropologists.

In a recent letter to the Cambridge University Reporter Professor Goody said relying on internal recommendations narrowed the

choice of candidates and reduced the chances of "less advantaged groups".

He added: "The favourable position of colleges as charitable institutions, and the desire to appoint the best candidates, as well as legislation against discrimination of various kinds, would suggest that, whenever college posts should be advertised."

News in brief

OU launches parents' course

The Open University is to launch two eight-week courses on parents' suitable for the majority of parents in the country.

The first course will cover the period from conception to the age of two, and the second from three to five years old. The aim is to increase knowledge and skills so that parents can make their own choices about child-rearing, the Open University claims.

The courses will be prepared in cooperation with the Health Education Council and the Playgroups Association, and will be presented in the autumn of 1979.

New LSE pro-director

Professor Alan Stuart, of the London School of Economics, has been appointed pro-director of the school in succession to Professor G. H. Grunfield. He became professor of statistics at LSE in 1966. He joined the staff in 1949 and became reader in statistics nine years later.

Holiday grants

Five grants of £150 each for vacation projects of educational value are awarded by the University of London's Vacation Trust each summer. Applicants must be London University students.

Details are obtainable from the Clerk of Convocation, University of London, Senate House, Room 104, Malet Street, London WC1E 7HU.

Trees for unity

Nearly 300 trees have been planted at Hull University in recent months as part of a landscape scheme intended to give a sense of unity to the campus.

Solar scientists to meet

The NATO Advanced Study Institute meeting will be held in the School of Physics of the University of Newcastle from 29 March to 6 April 1978. The subject will be "The origin of the Solar System" and scientists have accepted invitations to attend.

Newcastle saves energy

Newcastle University recently ordered a survey of the use of energy in its hall of residence. They were concerned that heating and lighting was being provided at times of the day when there was little demand. Following the survey, £3,000 worth of energy conservation equipment has been installed which is expected to pay for itself within two years.

Don's diary

Monday

I am a don, you are a lecturer, he writes "Don's diary". Receive invitation to write "Don's diary", and decide to be Crossman rather than Pops. Attend meeting of university steering committee and hear the verdict of Lord Radcliffe, our chancellor, on Crossman. Decide to be Pops rather than Crossman.

Business proceeds slowly, snail-happy lunch, teach hastily from 1.30 to 3, catch up with about five letters beginning "I should have written before" visit careers advisory service about forthcoming visit to local school, attend working party on Commonwealth literature.

Cannot think what Commonwealth countries have in common apart from the Queen and cricket, but do not make this lowbrow observation as we are busy forging links between Achebe and V.S. Naipaul, and home and get down to real work revising footnotes, so that my typist who deserves a chair in palaeography can read them.

Tuesday

I am an administrator, you are a committee man, he is a manipulator. Wake up in the middle of the night and realize that I am due to be visiting a school in Coventry and teaching at the same time. Arrive at university early and prepare desperately for threatened seminar. Telephone rings eight times. Attend staff meeting on examinations. After six weeks on the non-controversial items we manage to dispatch a controversial item neatly in quarter of an hour.

Rush to class and by speaking twice as fast and three times as excitedly as usual manage to get through a quarter of the work in half the time. Arrange desperately to meet for two hours next week. Drive furiously to Coventry. Show six-year-old film of university to lower sixth. Feel vaguely that the Beatles' songs in the film have a quaint period flavour, that the physics laboratories look indistinguishable from the laboratories, and that Cardinal Newman would not approve, but the school is very polite.

Drive back to university to catch up with footnotes, but find colleagues eager for a relaxed gossip. Attend evening meeting of steering committee. Where previously we agreed, we now disagree to disagree, where we agreed to disagree, we now disagree. No time to get on to our previous disagreements, or perhaps there is, as having delivered myself of the useful observation that Satan would make a good appointment in view of his many publications I leave the meeting early to be home by 11.

Wednesday

I am a scholar, you do research, he writes piling articles. Stay at home, writing book, looking after sick daughter, cooking lunch. Book goes better, please do not come to lunch, prospective reviewers. Summoned to university to hear dark warnings from the University Grants Committee about our future financial prospects. Wonder if Sir Fred Dalton has ever been to Delhi.

Chair meeting of board of arts. We behave beautifully, resorting to Latin and Greek when we want to be rude about each other. Agenda finished in record two hours. Come home and chat family at bath-time; we do not behave beautifully, do not resort to Latin and Greek, and the agenda takes another record two hours. My wife says kindly that she would not be very good on the board of arts.

Thursday

I am a brilliant teacher, you have not published, he runs after his pretty pupils. Arrive early to prepare for seminar. Go to library to

collect books on the Brontës which have vanished from the shelves. Our very good library coping gallantly with inflation has a fairly good system for recalling books, but last time I tried this the library started mercilessly harrying me to return books which I had recalled from myself.

Still we are fortunate not to have a library where one has to fill in everything in triplicate, though unfortunately not to work in Oxford or Cambridge where every book is available. Do we incur enough allowance for this in our teaching? Do we when complaining that our students do not read enough make due allowance for the enormous rise in book prices? We spend hours discussing the staff-student ratio and years discussing car parks, but our minutes on the library and the bookshop are fairly minute.

Fortified by these random and probably incorrect observations I find I have wasted an hour in the library doing nothing, return to room, correct essays, prepare for seminar, eat lunch, teach more content than usual, read UCCA forms, and return home early, feeling for once that I have almost conducted my day as I would wish.

Friday

I am a jack-of-all trades, you haven't studied your subject thoroughly, he knows nothing about anything. Drive in early to correct minutes of last meeting of board of arts. The registry office has taken the minutes in very unlike Benita Prem of Malcolm Bradbury's novel, but, alas, he is leaving for New Guinea, where he may read this tribute to his skill in rendering into tactful decisions our more important minutes. Arrive at university to find a mission in the South Sea islands.

Prepare myself for meeting on religious studies, aware that I have little time. Meeting cancelled. Prayers answered, but religion does not look as if it is going to make it in these hard times as a subject in the university. We only get classics through after a Homeric battle.

Arrange with chairman of theatre to take some of his students to watch Coventry versus Manchester United. Perhaps classics and religious studies should offer football as one of their courses to attract students. Discuss ways of improving the prospects of classics with chairman of French, see chairman of history scowling in a snowstorm, and realize that this is not

the time to broach the relative merits of religion and Mediterranean studies.

Tired by all these chairman refuse to librate and run about Albion which sounds like the board of arts on a bad day. Return home, and discover that I have scored six out of 24 on my son's homework. The questions on rational symmetry were too hard for both of us, but I am still better at addition and subtraction which seems to come late in the syllabus, although I have found it more useful than a knowledge of rational symmetry. My addition has defeated the income tax, although the final demand for the rates, not paid on the principle of rational symmetry, has defeated me.

All the rest of my post looks sinisterly demanding, but turns out to be innocuous. A letter asking why I have no television licence, barely allowing for the possibility that I do not have a television, recalls a sort of shrill giving strength for the income tax and the rates. A training in academic life is not a good training for life; we are much better at putting the television authorities in their place than coping humbly with the rates.

Go ball-ringing in the evening, an activity which reminds me very much of life at the university, where we all pull different bells in our own time, blaming other people for our own mistakes.

Saturday

I am overworked, you are tired, he gets up at ten o'clock. The morning offers a choice between writing about *Wuthering Heights*, or re-enacting *Wuthering Heights*, saving logs in the freezing woodshed, or, as I have decided, about Hindley Earnshaw. Mind turns fully to whiskey as a quicker way of warming house. Compromise by building up huge fire, starting on the whiskey and writing half a chapter in inspired rush.

Children look wistfully out of the window waiting for snow. The all purpose wife of the scholar closes the doors behind him, separates with difficulty the children's drawings from the teacher's lecture notes, yanks the children's school clothes, and administers the great administrator's house.

In the afternoon she goes out singing, and we have a jolly game, as a result of which *Wuthering Heights* seems to have been lost. Her lecture notes, and Don's diary get hopelessly intermingled. Give up in despair, and plan giant seed order to make myself self-sufficient, but will obviously never earn enough money in any of my other roles.

Sunday

I am a Christian, you go to church, he finds fault with the vicar's sermons. Abandon church with its opportunity to put the vicar right on Napoleon and abandon self-sufficiency to pick up cheap logs from packing factory. Sort out study. Write to research student hoping that his ideas on the Brontës coincide with mine, say farewell to neighbours who are leaving for Brussels, and arrange to come and stay with them to do work on *Villotte*.

Sympathize with another neighbour who is being evicted from his house, explore field for old bottles with my son who has discovered a tip there, and is convinced that an old bottle is almost as valuable as a gold sovereign. Persevere with wife to increase attendance at even-ings by 20 per cent, am in complete control at bath-time, decide that the chapter on *Wuthering Heights* does not need any footnotes, decide that unless we find a few gold sovereigns in a bottle jar I will not be able to go to Alentejo, decide to spend the Easter holidays teaching my children what they do not seem to be learning at school, decide to be more sympathetic to my colleagues, and my students when they say they have got problems, decide to do one thing well rather than 10 things badly.

Know that the pressure of next week will see a decline in all these lofty intentions, but it will be somebody else's turn to conjugate these decisions.

T. J. Winnifraith

The author is lecturer in English and chairman of the Board of Arts at Warwick University.

Inside threat to academic freedom



T. J. WINNIFRAITH

I begin with two facts. First, at an open meeting in February the Cambridge Students' Union voted to take action against the decision (adopted as an economy measure) to close the university library at 7 pm instead of 10 pm on Mondays to Fridays. On February 19 the council of the Senate passed a statement denouncing this threat and added, significantly, "it is understood, only about 130 persons took part". In the CSU meeting at which the vote was taken.

Second, on March 11 the Regent House of Cambridge University, which comprises all resident MAs who have signed official affiliation to the university or the college, voted to reject a proposal from the Faculty Board of Economics and Politics. The proposal was to discontinue publishing a classified list, divided into first, upper seconds, lower seconds and thirds, for part one of the economics tripos, for part two of the tripos, for part three of the tripos, for part four of the tripos, for part five of the tripos, for part six of the tripos, for part seven of the tripos, for part eight of the tripos, for part nine of the tripos, for part ten of the tripos, for part eleven of the tripos, for part twelve of the tripos, for part thirteen of the tripos, for part fourteen of the tripos, for part fifteen of the tripos, for part sixteen of the tripos, for part seventeen of the tripos, for part eighteen of the tripos, for part nineteen of the tripos, for part twenty of the tripos, for part twenty-one of the tripos, for part twenty-two of the tripos, for part twenty-three of the tripos, for part twenty-four of the tripos, for part twenty-five of the tripos, for part twenty-six of the tripos, for part twenty-seven of the tripos, for 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The dangers of rejecting mathematics

In attempting to structure the debate about the teaching of mathematics, the first question must be whether mathematics should be taught at all; and if so, what kind of mathematics, at which stage.

In many of its branches the education industry (like many others) is a major consumer of its own products in the form of teachers, researchers and education administrators. This can easily hide the crucial point that the *raison d'être* of education is that part of the output which is not self-consumed.

The argument that the purpose of teaching mathematics is to provide people who can teach mathematics simply will not wash. But neither is it wholly convincing to quote the need for mathematics in industry and government.

At least as far as school teaching is concerned, the inclusion of a subject in the curriculum is not a necessary precondition for recruitment to the corresponding profession. The case of the law is an obvious counter-example.

Secondly, it is clearly society's task—and therefore a political task—to decide the purpose of public education. Teachers have a vital contribution to make in explaining what is practicable and what is not, and in judging what means are required to achieve particular aims; but the choice of aims is that of citizens at large, the requirements for teaching teachers for schools and universities being evidently part of the means.

In writing about the aims of education, my position is therefore simply that of a concerned citizen, who has thought about these issues; being a professional mathematician gives me no particular authority in these matters.

The outstanding need concerning education in mathematics is that it should help someone live a useful and satisfying life. A prime task of any democratic society is to enable all its citizens to participate of its life and its culture.

This task involves mathematics in two quite different ways: firstly it involves mathematics directly, as a collection of topics, some of which the man in the street needs to grasp to be an effective and responsible citizen.

Perhaps the area where the unfulfilled need is greatest is, not, as is often said, in simple arithmetic (to choose sensibly in a supermarket or understand part of one's income tax assessment, important as such things are) but in statistics.

Much of prevalent superstition and misunderstanding about public issues is based on an inability to analyse the likelihood of fortuitous coincidences, on a failure to see that examining the probability of events *post facto* is irrelevant to testing a hypothesis, even to grasping the simple fact that it is not astonishing that half the children in the country are below average in ability.

Hermann Bondi discusses the practical, intellectual and cultural value of a mathematics education, and the issues raised for school and university courses

Some feeling for whether fluctuations are likely to be fortuitous or significant is also most helpful. Similarly, graphs, diagrams and tables should be reasonably intelligible to the responsible citizen.

One aspect—and possibly the most important aspect—of all education is surely the need to inoculate the electorate, our masters, against being bamboozled. Statistics only lie to those insufficiently protected by the vital antidote of an ability to criticize them intelligently.

To return to elementary arithmetic, training in its mechanics is certainly useful, perhaps more than in just preventing people from being mesmerized by it. For it is the wood instead of having to spend all their energies on encompassing just one of the trees.

The art of computation, however, is not merely the knack of getting the answer right more often than wrong. It means little whether one gets it right 70 per cent or 99 per cent of the time if one has no means of knowing whether the answer one gets in a particular case is right, wrong or wildly wrong.

For too many people accept the outcome of a calculation (whether performed on a calculator or by computer) as unchallengeable when in fact the simplest consideration should have shown them that the answer was grossly out. A course estimating ability is the most important part of numeracy.

No misunderstanding of mathematics is greater than that which thinks of accuracy as its chief aim. Precision is at little part of the essential nature of mathematics as it is of science.

Accuracy where this is essential must not be denied importance; but it is not the surface of the Earth is roughly spherical is a far greater deed of far greater significance than the accurate measurement of its polar diameter.

Equally important for mathematics teaching is its indirect cultural value. Intellectual curiosity is surely the most humanistic characteristic that education has a vital duty to foster.

Every school subject can and should do so, but I doubt whether any subject is superior to mathematics in the intellectual challenges and delights it presents in number theory, magic squares, polyhedra, algebraic equations, sets, differential calculus groups and so on.

A joint aim must be to increase adaptability. In our changing world, the demand for skills is bound to vary drastically in a human lifetime. To equip people to accept and, better still, to enjoy change is perhaps

currently the most necessary task facing education.

There is no subject called "adaptability" in our schools, and probably never can be, yet it seems plausible that any activity that stretches the mind of the pupil, that helps him to respond to them, will in fact foster his adaptability.

Again, while almost any subject can contribute, I doubt whether any is better at this than mathematics. It is easy to sneer at mental gymnastics, but it is hard to suggest a superior way of limbering up the mind.

So far my glowing tribute to mathematics has left out a vital point: the rejection of mathematics by so many, a rejection that in not a few cases turns to abject fright.

How many people say that this was their worst subject at school, how many people claim that they do not understand mathematics you need a special twist of mind, how many regard it as mysterious magic?

Why this widespread horror of what quite a few people enjoy? The excellent sales of books of mathematical puzzles contrast strangely with this common adverse reaction.

The negative attitude to mathematics, unhappily so common even among otherwise highly educated people, is surely the greatest measure of our failure and is a real danger to our society.

Not everybody can (or should) be a great mathematician, but surely the attitude to mathematics should be the same as to other subjects, namely, that anyone who wants to acquire a reasonable competence can do so.

No one claims that special aptitude is needed to become moderately good at Dutch, or even at chess, at Greek history or at golf; all we need is a willingness to work at it. I have no doubt that mathematics ought to be in the same category in people's thinking; but for many it is not.

This is perhaps the clearest indication that something is wrong, and indeed very wrong with the education that, at least, a share of the responsibility is harder to pinpoint the blame, and even more difficult to suggest new remedies.

Clearly we must to some extent look to the school mathematics teachers, particularly those at the upper levels who are (or should be) the product of university departments of mathematics.

This raises the question of the capacity of university departments,

of the attractiveness of their courses to students, and of the quantity and quality of those students who immediately—or after some other career—go on to teaching, itself critically dependent on the appeal of teaching in our schools to such people.

The historical development is, I think, very clear: in the 1950s the capacity of university departments was modest and competition to enter was great, leading to a massive expansion of their capacity in the 1960s.

Though demand at first grew sharply, its growth later slackened off, and by 1970 capacity began to outstrip demand, so that at first less-qualified students became accepted and, more recently, quite a few departments have spare capacity. Throughout these periods only a modest proportion of graduates went into teaching.

In the 1950s this may have been largely due to the great needs of industry and of government establishments for mathematicians in advanced technologies came in. During the 1960s the rapid expansion of universities implied that the growth of their staffs absorbed most of the high-quality graduates with any inclination towards teaching.

In both these periods the financial rewards of school teaching at higher levels compared unfavourably with opportunities in the universities. For these reasons a period when school teaching might at last come into its own. Now, in the mid-1970s, the conditions for increased recruitment to school teaching seem set fair.

The appetite of industry and Government for mathematics graduates is modest, that of universities almost non-existent, and the financial status of well-qualified teachers has been transformed by the Houghton award. Yet there seems to be no sign of the eagerly-awaited flood of new recruits to teaching, whether from new graduates, or even better, through mature entrants from other occupations. (It seems a great pity that teaching at school and university is so concentrated in the hands of people with virtually no experience outside education, who have been engaged full-time in the education industry since they were five years old. Teachers with an experience of other parts of society have much to give their students that others cannot).

Why are so few mathematics graduates entering teaching? In part no doubt because the Houghton picture of teaching as a profession without great rewards even for the most experienced and highly-qualified still lingers on. In the course of time the correct view that no doubt prevails—provided the process by which qualifications are not whitewashed away.

Another major reason is the greatly increased flow of mathematics graduates to many kinds of professions which are not tradi-

Professor Sir Hermann Bondi

tionally their preserve, a flow in itself greatly to be welcomed, for any insufficiency in the general cultural importance of mathematics.

This same flow-pattern can be observed at the school/university interface, where a much larger proportion than ever before of those mathematically qualified at a level do not aim to enter university departments of mathematics, but either see their future as not being a university course at all, or for other reasons.

How can we reach a more normal situation, tenable in the long run for any insufficiency in the number of mathematics graduates in the teaching profession will be a cumulative effect.

The position is wholly analogous to an article produced in mass-facturing industry which is not selling well. Industry knows from experience what it needs to do. First, it carries out market research, both through surveys and through experimental introduction of product lines, to discover what modifications in the product would make it more attractive to the intended group of buyers.

Then, when the new model has taken shape, it markets it by making widely known its new and more enticing features.

Surely our position is wholly analogous. University courses need to be modified through market research to make them attractive to those they want to attract: intelligent, ambitious young people with a will to learn and to apply themselves.

Making a course more attractive by making it easier might get numbers, but not of the clientele one aims for. Without a high level of intellectual challenge no course can attract the kind of person in whom the culture of mathematics is a joy.

No doubt such a process might lead to wide variations between the courses offered in different universities, and it would need a large and determined effort to spread knowledge of the differences, so that intending students could make informed choices.

It is therefore particularly important that there should be free

Continued on facing page

From previous page

movement of postgraduates between universities, so that no department need feel that what it can do at the research level is determined by what it offers to undergraduates.

A strong Science Research Council policy of actively (and if necessary fiercely) discouraging students from remaining in the department where they received their first degree is thus vital to the freedom to experiment at the undergraduate level. It would also counteract those students who stay on after graduation primarily because it avoids the need to make choices about the direction of their career.

Experimenting in entry qualifications may be advantageous, though the growth in numbers of mathematically qualified school leavers (itself a tribute to the success of new mathematics) in making the level choice more popular makes this appear less necessary at present.

If the growing shortage of inspiring teachers leads to a future drop in mathematics A levels (which is unhappy probability) then such experimentation could be most rewarding.

Just as university departments have to look to the market, so must the profession of mathematics teachers. What is done in schools in regard to organization, teaching methods, curriculum, and so on, with the intention of benefiting current pupils, will be thoroughly had for future generations of pupils if it discourages the entry into teaching of the best quality of potential teacher.

Once it has been decided that mathematics is to be taught, making its teaching an attractive job to those required as teachers is as important a task as any. To know what attracts and what repels is not easy, however simple it may be to become opinionated about such issues.

To transform study attitudes and intentions to a market orientation will be hard and not without pitfalls. But no other approach can come to grips with the core of the problem.

The author is chief scientific adviser to the Ministry of Defence and professor of mathematics at King's College, London.

David Newell describes his start to teaching

First impressions of a polytechnic

The advertisement had proved surprisingly successful. The juxtaposition of law and lecturing was the answer. Within two weeks of my appointment I had a choice of three places to live.

I chose the shared house whose other occupant was a Canadian nurse reading for the Open University. The house was part of a Victorian terrace built by Fowler, who moved into the property himself with the proceeds of his trade sales.

The street was cobble and carless, preserved through the pressure of the local Victorian Society and now predominantly Asian-owned. I felt that living in this Victorian terrace I would at least be able to identify with the popular perception of the polytechnic as the "people's university".

My interview had been uneventful. My interest in the concept of community education had begun pondered to by the suggestion that the polytechnic's law and sociology departments were combining on a research project examining the effects of the Race Relations Act in the East Midlands. I was also pleased to hear that sociology was a compulsory subject for all full-time law students.

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The author is chief scientific adviser to the Ministry of Defence and professor of mathematics at King's College, London.

full-time degree. My large amount of tutorial work will prove a nightmare when the department's overall staff/student ratio is worked out.

I find the tutorials stimulating, but as it becomes apparent to me how little work the students are doing for them there is a tendency to follow their incoherence, I avoid the polytechnic library, crowded and a little like a public library, and use the university library.

I am told that this is strictly "out of bounds" when calculating one's thirty-hour week, but I take no notice of this farcical regulation. The greatest difficulty seems to be in reaching a correct balance of priorities between preparing tutorial work, research, correcting my thesis, and socializing with staff and students.

I am surprised by the lack of emphasis on research work in the department. It seems to be the exclusive province of the younger lecturers, many of whom are doing external higher degrees at local universities.

There is little evidence of any "pooled" research projects or collaboration with different departments. The relations project, which had so interested me had been abandoned for technical reasons before I had arrived—possibly a case of interview misrepresentation.

A very unusual attitude exists towards the sociologists, the compulsory sociology topic in the degree course not being integrated into the approach adopted towards the substantive law subjects. It is in effect taught in a vacuum with little liaison between the lawyers and the sociologists. The first board of studies meeting, emphasized this, with the sociologist being treated with suspicion when he attempted to suggest that he and his colleagues might be able to supervise some of the third year law projects which involved a sociological content.

My major disillusionment is not based on the lack of financial resources of the polytechnic in comparison with the universities, or on the organizational chaos which existed at the beginning of term, but on the lack of academic leadership in the department, and surveying students.

There is an absence of any debate about the content and purpose of the degree course. Despite the

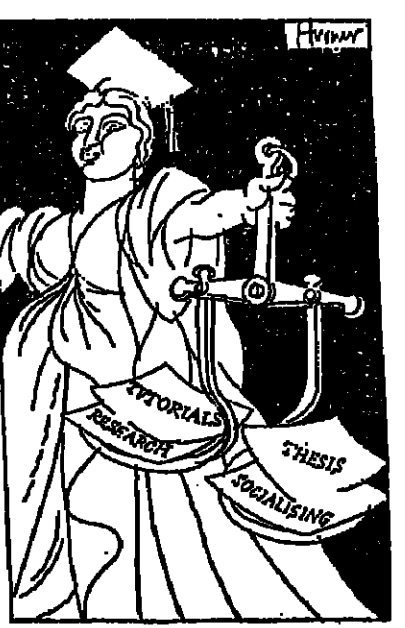
evidence of a more powerful bureaucracy than exists in the universities, the senior staff concentrate the majority of their time on day-to-day administration.

Prior seems to be concentrated in few hands, both in relation to course content and organization, and internal department decisions. There is no definition of the aims of the degree course, resulting in it sinking into being a vocationally-orientated imitation of a University law degree.

The confusion of aims seeps downwards, and the new lecturer begins to get into the habit of working from day to day. His approach lacks coherence as he is given little scope for initiative or fostering the ideal of developing a community-orientated approach towards his subject.

The work gets done, the students get their degrees, and from the outside the poly seems to fulfil its function, but the teaching experience leaves a sense of disillusionment.

The scope is limited to perfecting the time-table commitment, ironing out irritating mannerisms, aiming for greater clarity of expression, and perfecting the art of leading but not monopolizing discussions.



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The case for 'conditional grants' for home students

Home students are much more heavily subsidized than overseas students on the same courses—a differential which is not common in other countries. How do home students' subsidies match up to the subsidy principle we put forward in our first article (THESE, March 19)?

We cannot believe that the "external benefits" generated by the marginal student year on a "typical" course are as large as £200—nearly equal to a manual worker's average annual wage. Certainly the present value of the stream of additional income generated by one extra year of education (discounted at 5 per cent) is not more than £1,000.

If the subsidy is inefficiently high, one asks whether it can be justified on grounds of income redistribution. This seems unlikely. If judged in terms of lifetime income, students are among the richer members of society. Even if higher education does not raise their later incomes, any subsidy gives them opportunities for self-enrichment for which other members of society are paying.

A. G. Layard, "On measuring the redistribution of lifetime income", paper presented to the International Economy Association Conference, Turin, 1974.

The problem for students is that while they are students, they are poor. Present arrangements for maintaining them are deplorable. A method needs to be found which (a) enables students to maintain a decent standard of living, but (b) does not transfer lifetime income from the poor to the rich.

We would favour the following arrangement. The existing unconditional grant would be frozen at its current money value (not at its current purchasing power). Clashes of parents with a silver-haired parent would continue to be paid the same money grant. This would preserve the existing discrimination in favour of students from poorer homes, which has made higher education less class-biased in Britain than in most of Europe.

On top of the unconditional grant, students could take out a maximum £100 conditional grant, that for each £100 of conditional grant, the student would pay back 0.1 per cent of his income via the Inland Revenue during the first 20 years of his working life.

Such a scheme would be self-balancing at a real rate of interest of 5 per cent, and consequently no long-term burden on the rest of the community. As inflation proceeded, the conditional grant would provide an increasing fraction of students' total costs.

The second of two articles by Tony Flowerdew and Richard Layard on student grants and fees

One must recognize that this scheme would not help the Government's short-term problem. Any increase in students' spending power is going to be inflationary. If it is financed by the Government, but students' living standards should be raised in any case.

This scheme is a way of doing so which is both fairer and more efficient than increasing the unconditional grant. It encourages education, the effect will be small—the same as for an equivalent increase in the income tax.

The scheme is not a new one. In 1974, the Higher Education Policy Group, including seven present or former chancellors, presented for discussion a variant of it, whereby the student would go on paying the income-related surcharge until the conditional grant had been paid off. It is a simple, but not a new, idea.

better that the risk should be pooled, those who do well contributing to the financing of the less fortunate.

One issue is: How large should the maximum be? We would favour a liberal one. This would be particularly useful to students whose parents, though well-to-do, do not pay the full parental contribution.

An alternative approach to this problem, favoured by the National Union of Students, is to abolish the parental contribution. Unfortunately, this would inevitably increase the proportion of middle-class students in universities, and extend the process by which higher education finance redistributes from poor to rich.

The final, and rather different, question concerns the level of home students' fees. Here the basic issue is whether a greater part of each university's income should very gradually increase from year to year with the number of students.

The Committee of Vice-Chancellors and Principals used to be in favour of having fees that provided something like 20 per cent of university income, on the grounds that this provided flexibility to universities and encouraged them to respond to student demand. However, it is a relatively long time since the CVC was asked to consider the issue, and its arguments remain unchanged, and provides a good case for raising home fees to the same level as overseas fees, provided this was not over £600 a year.

The main practical problem with increasing university autonomy by raising and indexing fees is that this transfers expenditure from central to local government. But it ought to be possible to deal with this through adjustment of the rate of support grant, or by letting the central government pay the fees.

To summarize our two articles, we are against any increase in overseas students' fees beyond say £600 a year. If home students' fees were raised to the same level, this would encourage universities to be more responsive to student demand.

Finally, we think home students are given too much outright grant but too little grant in total. The difference should be made up by a "conditional grant" by which the student would repay a small specified fraction of his subsequent income in return for some of the help which he received as a student.

Tony Flowerdew is senior lecturer in economics and Richard Layard is reader in economics and head of the Centre for the Economics of Education at the London School of Economics.

‘Jaws’, ideology and film theory

Every review of the film *Jaws* begins with some reference to its status as (the film, not so much super-production as super-product, the box-office record-breaker expected to gross more than a quarter of a billion dollars. But the product also means (part of its meaning, of course, is to be "the most profitable movie in history"), and means as *entertainment*, a moving and pleasurable experience marketed and bought.

Signifying indicates the recognition of film as system or series of systems of meaning, film as articulation. *Practice* stresses the process of this articulation, which it thus refuses to hold under the assumption of notions such as "representation" and "expression"; it takes film as a work of production of meanings and in so doing brings into the analysis the question of the relation of the subject with what it represents, relations of the subject with kind of "reader" and "author" it constructs.

Specific represents the need for analysis to understand film in the particularity of the work it engages, the differences it sus-

Specificity here is semiotic, and a semi-
otic analysis of film—of film as signifying
practice—is the analysis of a heterogeneity.
The range of codes and systems at work in
film over and across its five matters of ex-
istence: moving pictures, language, sound,
fixed monetary value, recorded noise.

recorded musical sound, and writing; the latter as, for example, in the prominent "Amity welcomes you" hoarding in *Jaws*).

Specificity is thus both those codes particular to cinema (codes of articulation of dialogue and image, codes of scale of shot, certain codes of narrative organization, etc.) and the heterogeneity in its particular effects, its particular inscriptions of subject and meaning and ideology. Directed in this way, the study of film is of neither the "medium" or "text" but breaking the deadness of their opposition, of operations of the process of film and the relations of subjectivity in that process.

Such a direction can further be seen as holding in a fundamental intersection three component areas: the conditions of film production and distribution, the individual filmmaker and the general apparatus of cinema. As was said, in the film industry, manufacturers of film products but these products mean to sell on meaning and pleasure; between industry and text, we also need a category like *machine*.

This category is cinema itself, understood in its stock of constraints and definitions, its possibilities and points of determination with respect to which film can be distinguished as such. In this sense, the machine is a particular film solved dialectically in its operation. Each of the three areas can bring with it its own set of tasks and study procedures, but attention to their intersection is constantly important.

In the light of these propositions, let us come back to *Jaws*, to this particular film. Space will not permit detailed analysis of the movement of its filmic system; one or two fragmentary indications must serve to suggest the terms of that movement, and lead on to some consideration of machine and industry, indications that will be developed from the opening shots of the film.

The first shot, the camera underwatches the veering rapidly for through the sea forest to the accompaniment of rhythmic music. Cut to a group of young people at a night-time beach party; the camera is heavily marked by changes in colour, from the coldish underwater tones to the rich orange-yellow reflections of a fire, in music a youth is playing a harmonica, and in rhythm, the camera now tracks smoothly right along the group—faces kissing, smoking drinking—until it stops on a young man

Evelyn cut to the girl who is revealed as the object of his gaze, followed by a cut to a high angle shot down onto the party establishing its overall space. Then comes a run down to the sea, the girl shedding her clothes as the boy stumbles drunkenly after as she swims out, the boy collapses, a third underwater shot, now moving up to the

surface between the girl's legs, precedes the shark's attack; the next morning the boy wakes, slips up into frame as we look out with him on the empty ocean.

For the narrative, this sequence is precisely and simply the beginning, the

initial premise: the arrival of the shark. At the same time, however, it sets off a number of other series which knot together as figures over the film.

Thus, for example, the presence of the shark is given in the very first shot with its violent underwater movement tied to no human point of view, and the underwater shot is then used in the first part of the film to signify the imminence of attack and is picked up as the shark rises to the girl and, later, to the little boy on the float.

Once systematized, it can be used to cheat: it occurs to confirm the second daytime beach attack, but this is only two boys with an imitation fin. More importantly, the shot blinds up with an immediate mark-

Indeed, the drama of vision becomes a constant reflexive fascination in films. Hitchcock's *Rear Window* in a supreme example, but *Jaws* is also relevant with its play on the unseen and unforeseeable, the sudden shriek and the moment of violent irruption. The shark is in the boat-bulb, nearly as far from the water close behind Brody as his shovel's clump.

Jaws, moreover, has the whole film summarized in the images flickeringly reflected on Brody's glasses as he skims through the pages of the books about sharks, occasionally fixing a corresponding image—the whole film except, precisely, for Brody, the vision we

following shot, now from left to right—away from the sea, out of Quint's shuddering vision. There's to swim back to the boatload of women!" In the film, as the men set off to deal with the evil, the boat seen in long shot through a trophy pair of shark's jaws.

The stress on dismemberment—after the girl, all the victims are male and this focus is on losing leg—finds its resonance in the earlier scene of the shark attack. Quinn and Hooper compare shark wounds (and drink to their legs!), as again does the apparently gratuitous image of the old man in the bathing cap with hanging breasts who comes to taunt Brody with his fear of the water.

This excess over the narrative in the opening sequence disturbs the coherency of the end. In the former we look out with a boy (the boy is not named, but is clearly the same as the boy who is seen in the opening sequence repeated from Brody's point of view); in the latter we look with Brody and Hooper from the shore at the boat as it is being destroyed. Brody's fear overcame ("I used to hate the water, I can't imagine why"); a dodging, rhythmically inverted, high-angle shot shows the boat being destroyed. The meaning of the sequence is not clear, but it is clear that the sequence is a key to the understanding of the film in these terms.

Jaws has placed the focus here on the dominant American cinema, but it must be stressed that such an understanding is a polemic statement in itself. In certain areas of avant-garde development, the material content of the film is seeking to pose the material content of film in the interests of alternative practices, other cinema.

the film's rich text, series and text combine across the film. The parent text of repetition (and series) is rhythmic repetition, turns in the film is potentially verifiable flux of affects, a plurality of intensities, and narrative functions to contain that affectivity, which is thus "re-released" as "excess" disturbance." "figure"—synymptomatic demonstrations of the work of containment.

This engages the interaction with cinema that study be directed, critically and specifically, to Hollywood film itself as signifying practice.

The author is lecturer in English at Cambridge University.

The author is lecturer in English at Cambridge University.

Honorary degree

elementary

Mr. F. Duckworth, at present senior lecturer in charge of Sheffield University's department of orthopaedics, has been appointed to a personal chair in orthopaedics at the university.

Forthcoming events

A second conference on "The Teaching of electronic engineering in degree courses" will be held from April 7 to 9 at the University of Hull, Hull CV1 7RX. Fee: £34. Details: The Conference Secretary, Department of Electronic Engineering, Hull University.

* * *

The Consortium for Drama and Media in Higher Education is holding it

Forthcoming events

The Consortium for Drama and Media in Higher Education is holding its annual conference tomorrow at the **St George's Elizabethan Theatre, London**. It will discuss the value of audio-visual media and materials in the teaching of drama at university level. Fee: £11. Details: the Hon Sec, Consortium for Drama and Media in Higher Education, care of BUFC, Royalty House, 72 Dean Street, London W1.

* * *

The Building Centre Trust and The Fire Protection Association with the

16-20 **Medici su Patrona**

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|--|--|
| 18.20 | Medicine as Patron (A201 : prog 6) |
| 18.20 | Introduction to the history of engineering
mechanics : Transmission |
| 18.40 | Decision making : In Britain : The
Academic Study of Public Order |
| 19.00 | Curriculum design and development :
Discussion (A203 :
prog 6) |
| 19.20 | Health and work : Women at Work :
about making : Women at Work :
descriptive government and public
future of Sweden's Politics
(D231 : prog 8) |
| RADIO 3 (VHF)
(Applying) programmes for North Scotland
and parts of Wales | |
| 20.00 | Medicine and Reformation : The
Science and rise of technology since
16th Century (A281 : prog 1) |
| 20.00 | Medicine and Reformation : The
Temperament of World (A282 : prog 1) |

Sunday March 28

- | | |
|------|---|
| 7.40 | Technology foundation course : Electricity and Magnetism (T100) : prog |
| 5.06 | Making sense of society : Analyzing Social Interaction (T101) : prog |
| 5.30 | Science foundation course : The Periodic Table and Chemical Bonding (T102) : prog |
| 5.58 | Systems block order : Air Traffic Control : Simulation (T103) : prog |
| 5.20 | Analysis : Least Upper Bounds (T104) : prog |
| 0.48 | Practical : chemical processes : Electrolytic Chlorine Cells (T105) : prog |
| 0.10 | Prog 41 |

Thursday April 1

- ABC 1**
- 7.05** Statistical sources: Statistics Division-making Housing Survey (D291; : prog 2).
- 7.30** Economic development: An Abolition? (D1801; : prog 4).
- BBC 2**
- 6.40** International politics and its policy: The Super-Crisis—The Actor Environment (D337; : prog 8).
- 7.05** Linear mathematics: Basic and advanced with Linear Equations (66 prog 8).
- 7.30** Comparative physiology: Diet and Feeding Mechanisms and Diet in Animals (D23; : prog 4).
- 17.00** Earth science: geology.

Tuesday March 30

- 7.02 Mechanics and applied sciences
 Systems of Particles (181722; 2 p)
 7.30-2 Telecommunication systems: 4 tr
 mission Lines (17311; prog 4)
 SSC 2
 0.40 Social psychology: Cognitive M
 7.05 Soviet government and poli
 7.30 Soviet Agriculture (12334; prog
 11.25 (Soviet prog 2)
 17.00 record (1981) prog Changing
 17.22 People and organizations:
 Computing and Computers:
 (19711; prog 5)
 17.50 The age of revolutions: Looking
 18.15 Intellectual Africa (1819; prog 2)

Friday April 2

- SEC 1
- 7.05 Principles of chemical process
Electricity Chlorine Cells (1974)
prog 4.
- 7.33 The digital computer: Using the
TM221 : prog 3).
- SEC 2
- 8.40 The nineteenth-century novel and its
theory : Coleridge to Turgenev
Literature (A204 : prog 4)
- 7.05 The age of revolutions : Looking at
Napoleon (A204 : prog 4)
- 7.20 Modern art from 1848 to 1945 : Impres-
sionist, styles and social impact
The drawings of Seurat
1945 : prog 3).

Wednesday March 31

- 7.06 Diode, transistors, and electronic
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Tuesday March 29

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The Times Higher Education Supplement (London) Room 541
Tel. 202 6386755 National Press Building
Washington D.C.

Minority leader attacks positive bias as 'futile'

Single women lecturers receive higher pay than single men; highly qualified Blacks with many publications to their name are paid more than Whites with similar qualifications; but Blacks with similar qualifications lag significantly behind Blacks and Whites.

These controversial conclusions are about to be published by Professor Thomas Sowell of the University of California at Los Angeles, in a study on affirmative action.

Professor Sowell, a research fellow at the Hoover Institution of Stanford University, is a leading Black critic of affirmative action and was invited to the White House to put his views to President Ford recently.

"The crucial variable for academic women's earnings is marriage," he said in a summary published by the magazine *Public Interest*. "Single academic women with a PhD achieve the rank of full professor more often than do other academics with similar years of experience, though married female PhDs achieve that rank far less frequently."

Professor Sowell said that the gross male versus female comparisons were lopsided largely because married women, and especially married women with children, dragged down the averages of other women.

Turning to the position of Blacks, he said in 1972-73 White academics earned on average \$640 more than Blacks, but when graduate degrees taken into account, Blacks usually earned slightly more than Whites in the same field.

Black academics who had published five or more scholarly articles averaged about \$3,000 dollars more than White academics with similar records. Black

teachers who had published nothing earned slightly less than their White counterparts.

But Orientals earned less than Blacks or Whites, even if better qualified than either—whether measured by the percentage holding a PhD, the proportion of PhDs from top-rated departments, or the number of publications per person.

More than 40 per cent of all Oriental teachers had published five or more scholarly articles, compared with 31 per cent for White and 12 per cent for Blacks.

Commenting on the overall impact of affirmative action, Professor Sowell said if the programme were "innate, futile and costly," it might deserve no more attention than other Government programmes of the same description. But it had side effects that were negative in the short run and perhaps poisonous in the long run.

During the 1960s, before affirmative action, Black incomes in America rose at a higher rate than White incomes. So too did the proportion of Blacks in college and in skilled occupations, and there was a faster decline in the proportion of Black families below the poverty line.

Black income as a percentage of White income reached its peak in 1970—the year before numerical goals and timetables. This percentage had since gone down.

"What affirmative action has done is to destroy the legitimacy of what has already been achieved, by making all Black achievements look like questionable accomplishments, or even outright gifts."

"Here and there, this programme has undoubtedly caused some individuals to be hired who would otherwise not have been hired—but even that is a doubtful gain in the larger context of attaining self-respect and the respect of others."

Service colleges record high drop-out rates

Almost one in every second student of last year's graduating class at the United States Air Force Academy dropped out, according to a Government report. Attrition rates at the other four service academies also reached record levels.

The General Accounting Office report showed that at the Air Force Academy in Colorado Springs the dropout rate was 46 per cent, at the Naval Academy in Annapolis it was 39 per cent, the highest for 12 years, at the Military Academy at West Point it was 36 per cent, a little lower than last year, at the Coast Guard Academy 46 per cent, and at the Merchant Marine Academy 38 per cent.

Most students drop out in their first two years, and the General Accounting Office predicted that this year the rates would fall to 38 per cent at the air force and naval academies, 43 per cent at the coast guard and 39 per cent at the merchant marine academies and remain around 36 per cent at West Point.

High drop-out rates considerably increased costs, as they left unused places and spare capacity. The average cost of educating an air force cadet in 1974 was up 16 per cent to \$16,100. It rose 10 per cent to \$12,800 for each military academy, and 13 per cent to \$9,200 for each naval cadet.

The report said the main reason for the attrition seemed to be inadequate lack of motivation.

Embarrassing riches for Congress

The education committee of Congress has voted more money for education than President Ford wants to spend and the Department of Health, Education and Welfare is trying to show why the extra money is not needed. However, a final decision by the full Congress will not be taken until this year.

Recently the House education and labour committee recommended a ceiling of \$10,900m for the education division of HEW for the next year. This is \$4,000m more than President Ford recommended in his Budget earlier this year, and almost doubles the amount set aside for student aid.

Mr John Phillips, deputy commissioner for higher education, appeared before the education appropriations subcommittee and said the lower amount was adequate for what he believed was the proper role of the Federal Government in higher education. In view of fiscal conservatism, "higher education will have to make its lumps with everyone else," he said.

When it was the turn of Mr Terry Bell, education commissioner, to testify, committee members listening to his defence of a Budget lower than last year's, asked whether the United States led the world in literacy rates.

Embarrassed, he said it was "number one in access to free public education" but fell behind other countries in the percentage of citizens who could read and write. Mr Bell could not tell how much it would cost to eliminate illiteracy by 1980.

Congress has also been giving HEW a rough time over the President's proposals to consolidate 13 separate grants for various education programmes into a single block grant to the States which they can spend as they like.

Congress does not like the idea because it also cuts the total amount of money available. In particular it does not sanction the cut in Federal funds for disadvantaged children.

This is the first year of new Budget procedures which make it very difficult to determine how much each Government department will eventually get.

There will be a lot of complicated, behind-the-scenes bargaining between the education committee of both Houses of Congress, the Ford Administration and the new all-powerful House and Senate budget committees.

Even when a final compromise is reached, the President can still force through changes if he wants. The final shape of the 1977 budget, which starts in October, is not likely to be clear before September.

Ottawa meeting sets precedent

The Association of the Universities and Colleges of Canada is to hold a joint meeting with representatives of the Federal Government and the 10 provinces at the end of this month to map out the future role, size and cost of Canada's universities.

The meeting is not expected to prepare concrete recommendations; its importance lies in giving universities themselves a major say in national higher education policy.

The meeting is a direct result of January's unprecedented talks between the association and Mr Pierre Trudeau, Canada's Prime Minister, when the association argued that universities should be included in

future discussions on national higher education policy.

Specifically, the association wants to extend the present fiscal arrangements for universities for another two years. They are due to run out next March, having already been twice extended and running for 10 years.

In the meantime, the association wants to see the outline of a national policy as opposed to provincial policy on such things as the proportion of state funding going to universities, or be restricted to the American (British) proportion, foreign students, the financing of graduate studies and the responsibilities of the Federal and provincial governments in university affairs.

Maryland gets back its funds

A Federal judge has blocked the attempts by the Department of Health, Education and Welfare to cut off all higher education funds to the State of Maryland.

HEW's Office of Civil Rights has tried to do so because it said the State had not made enough effort to integrate its colleges and universities.

Judge Edward Northrop, in a strong attack on the department, rejected the attempt to enforce desegregation in "brazen defiance of its own regulations."

Referring to the 1964 Civil Rights Act, he said the "Office of Civil Rights" have not followed the mandates of the Act in that they have

arbitrarily and whimsically failed to attempt to work toward compliance by voluntary means and have instead refused to assume a programmatic approach."

This is a slap in the face for HEW, which lost patience with the State's delay in complying with its own regulations. Judge Northrop previously voiced strong criticism of this move. But it is a setback to the Office of Civil Rights, which may make further compliance through legal action.

The judgment is not unexpected, as Judge Northrop previously voiced strong criticism of this move. But it is a setback to the Office of Civil Rights, which may make further compliance through legal action.

Stanford to repay \$150,000 'outside consultancy money'

Stanford University has agreed to repay about \$150,000 because of excessive consulting by staff engaged in Government-sponsored research.

More than \$100,000 of this amount is an estimate by the university based on a random sample of outside consulting in a survey conducted in cooperation with the Defence Contract Audit Agency.

There is no suggestion of fraud or research contracts not being properly fulfilled; but there are limits on how much time teachers may devote to outside research and these appear to have been overstepped. Stanford has agreed to foot the bill as it felt its own guidelines were not clear, and it is now issuing new ones.

The investigation began when the audit agency found that three Stanford researchers appeared to be earning excessive amounts on consultancy work. The university has a rule that not more than one day a week can be devoted to outside consultancy.

All three had fulfilled their uni-

versity teaching and research responsibilities. Their consultancy work was done at weekends, in the evenings and in spare time.

The problem is one which is by no means confined to Stanford though it is one of the first to be results.

It is also an extremely delicate matter: at issue is the question of a teacher's time, after his responsibilities, in his own case to double shift of 16 hours a day. Stanford says he may not. Clarifying its policy the university has ruled that no full-time university employee may spend more than 13 days every three months (an academic quarter) on outside consultancy, no matter how small his academic timetable or how little time is to be taken on two jobs at the same time.

In future anyone who violates the rule will have to pay back the fee—considerably inflated by overheads and indirect costs added in—from his own pocket.



Arctic presence: raising political huddles

Arctic research body moves out after finance dispute

After 30 years in Montreal, Canada's prestigious Arctic Institute has now been formally established in its new headquarters in the University of Calgary.

But while its staff are looking forward to a new start and fresh research, the move from Montreal has raised political huddles in both Quebec and Alberta.

The Institute leaves behind considerable bitterness at McGill University, its former home, and has run into concerted opposition in its new home from the nearby University of Alberta.

The Institute has not yet been promised the considerable financial support it expected from the Government. It has preeminence is now threatened by a project emanating from McGill to coordinate the work of all the other university Arctic centres.

For years the institute has been one of the leading world centres of Arctic scholarship. Founded as an autonomous body in 1944, it had an American branch in Washington and was linked with Greenland and the then independent State of Newfoundland. But the Montreal branch was always the

more important, and, based at McGill, it gradually acquired an incomparable library.

Recently, however, the institute began running short of money, its governing body, and particularly Mr R. C. Currie, the chairman, were eager to move to Alberta.

Canada's boom province, where they expected generous support from the oil-rich Government. Mr Currie is vice-president of a Canadian oil company.

McGill and the province of Quebec became alarmed and for the first time last year contributed a substantial sum—\$140,000—to the institute as an inducement to stay. But the decision to go was taken and the move to Calgary was happy to become a new start.

In January the Government of Quebec, in an almost comical last ditch move to keep the institute, declared its library a cultural asset which could not be moved from Montreal. But it was too late: the books were already packed and on the way to Calgary.

McGill, which supported the institute for 30 years is bitterly disappointed, and has turned down a request to continue to provide free space for a branch information centre. It had deliberately not duplicated the institute's collection, and is now left with very little.

Meanwhile, the University of Alberta strongly resents the setting up of the institute in Calgary which it sees as a competitor to its own well-established and prestigious Boreal Institute.

All the way with LBJ

A new course called "The LBJ Years" is being offered at the University of Texas at Austin. The course will emphasize President Johnson's influence—which is considerable and controversial—on the policies through his political beliefs. The course is part of the American studies programme.

Punishing basketball

The University of Minnesota has been ordered to pay back \$21,400 which it received for taking part in a regional basketball tournament after its basketball team was found guilty of violating the rules for the university sport laid down by the National Collegiate Athletic Association.

Republic of Ireland

Limerick fails in university status bid

from Peppy Earlow

DUBLIN

After a lengthy wrangle, the immediate future of the National Institute for Higher Education in Limerick has been resolved by a decision of the National University of Ireland to accept it as a "recognized college" of the university, and to validate four of its first five degree-level courses.

This gives the NIHE the same status in relation to the university as a teacher training college, three of which have also achieved "recognized college" rank within the NUI.

Although the degree the NIHE is to award will now be those of the university, for all official purposes the validation procedures will be monitored by the authorities of University College, Cork, a full constituent college of the NUI, which is some 60 miles from Limerick.

Last week's decision removes a substantial degree of doubt for the students in four of the NIHE's current graduate schools, but implies that in one course—that designed to lead to a degree in administrative sciences—they will be expected to do an extra year's study in order



King John's Castle, Limerick from the Shannon.

to satisfy the university authorities that they have reached an appropriate standard.

In accordance with the terms of the decision, all the NIHE teaching staff have been accredited as teachers of the university, thus dispelling any of the doubts created by an earlier confidential report by the university which argued that a minority of the lecturers were inadequately qualified or were not teaching in the fields for which they were qualified.

The decision has not been welcomed with anything like enthusiasm either by the NUI governing body or by its students' council.

The governing body, which decided after submitting its request for validation that it would prefer full university status—and tried unsuccessfully to have its earlier application withdrawn—must now face the likelihood that its growth to full university status has not been postponed, possibly indefinitely.

The student body, on the other hand, has been mounting a year-long campaign to have all non-university qualifications awarded by the National Council for Educational Awards, which was stripped of its degree-level validation powers by the Government in a decision of December 1974, still to be incorporated in a White Paper and in legislation.

Holland

More than ever want to study

from Arnold Lissauer

AMSTERDAM

The total number of university students preparing for academic examinations last December was 120,100, an increase of nearly 7 per cent compared with the year before. Of the larger faculties those of literature and agriculture showed the biggest increase.

For the academic year 1975-76 the number of newly-enrolled students was 19,000 or 6 per cent more than in 1974-75. Again, the biggest increases occurred in agricultural sciences (41 per cent) and literature (24 per cent). Social sciences saw a drop of 12 per cent.

The increase in the number of first year students was, however, less than the number which passed the final examinations in the two types of grammar schools, the *gymnasium* and the *atheneum*.

Some 30.4 per cent of new entrants were women against 28.5 per cent the year before. In all, women account for 25 per cent of the total university population.

Norway

Sex equality Bill likely to be dropped

The Government's Bill on equality between the sexes, which seeks to ensure equal opportunities for in-service training, further education and leave of absence for study (*TYSS*, October 10, 1975), is likely to be rejected by Parliament.

The minority Labour Government has failed to win backing from any of the opposition parties since the Bill was introduced last autumn. The Socialist Left party, which was expected to lend support, has criticised it for not being strong enough.

The proposed law would have meant that women applying for university or college jobs ultimately filled by men would have had the right to demand written statements from employers telling them what educational and other qualifications were possessed by the successful applicant.

\$89,000 for UN

Norway is to contribute 1m Nkr (€89,000) towards endowment of the United Nations University this year. The second Scandinavian country to do so, the decision follows the Swedish allocation of 1m Skr (€112,000).

Sweden

Student union membership expected to be voluntary

from Mike Duckenfield

STOCKHOLM

Plans to abolish compulsory union membership for students in universities and colleges are likely to result in the Swedish Union of Students losing two-thirds of its present 100,000 members and could put a severe strain on its existing services, according to the union's chairman, Annika Sandström.

Proposals to reform the unions at both the national and local level were presented recently to Mr Bertil Zachrisson, Education Minister, by a six-man Government committee which has been examining the question of compulsory membership since the new Swedish national Constitution was adopted in 1973. One clause of the new law guarantees freedom of association.

The committee, which included a representative of the main national union (*Sveriges Förenade Studentkårer* (SFS)), also felt that compulsion to belong to a student union was outdated due to the considerable influx of mature students who already belonged to other trade unions.

The biggest problem, however, which has not been resolved by the committee, is how the unions will make up for income lost due to the decreased number of affiliation fees.

At present the SFS receives 16 Skr (€1.90) from each student for each of the two terms in the academic year. If membership fell to the extent predicted by Ms Sandström, which is not unlikely, income from fees would plummet from 1.6m Skr a term to slightly more than 500,000 Skr.

Although the committee recognizes the problem and suggests that compulsory membership should not be abolished until another means of financial support can be found, it puts its main hopes on future negotiations between the unions, the Government and maybe local authorities.

The reforms, which the committee would like to see implemented with the start of the newly reorganised higher education system on July 1 next year, would also mean the creation of a new network of student councils. In future each institution would have just one council, bringing an end to separate faculty councils.

At present compulsory membership in local unions is almost universal. Under the reformed system such unions would no longer exist, their place being taken by the new student councils.

At the national level, about 75 per cent of students belong to the SFS, with the remainder mainly belonging to a smaller union for technological institutes.

Unesco

Mediterranean mutual recognition

A draft convention on the recognition of studies, diplomas and degrees in higher education in the Arab States and European countries bordering on the Mediterranean has been drawn up by a committee of governmental experts convened by Unesco.

The convention, produced as part of Unesco's programme to increase the mobility of higher education personnel, is not based on the static notion of comparability of qualifications but on the more flexible idea of the recognition and evaluation of training and skills acquired in comparison with education taking account of the maturity and experience of the individuals concerned.

Member States concerned should be able to sign the convention before the end of the year. It will be followed by other agreements for the Arab States, Europe, Africa and Asia as steps towards a universal convention.

The talks failed and since then the annual inter-variety match, similar to the Oxford and Cambridge match at Twickenham, has been cancelled.

South Africa

Cape Town's multi-racial rugby plea

by Sue Reid

The University of Cape Town is now negotiating with the Government over the possibility of putting up a multi-racial team to play in its main inter-variety rugby match.

The match, played each May against neighbouring Stellenbosch University, was until 1973 the highlight of the university year. But then the Cape Town students began to argue that Black students should have a chance to play in the match alongside their White counterparts.

This viewpoint angered the less progressive Stellenbosch which refused to join Cape Town University in talks with the Government, which must give special permission for multi-racial sporting events.

The talks failed and since then the annual inter-variety match, similar to the Oxford and Cambridge match at Twickenham, has been cancelled.

France

Worst violence since 1968

from George Morgan

PARIS

The Latin Quarter was the scene last week of violent clashes between students and security forces on a scale unknown in the city since the events of 1968.

A protest march involving an estimated 15,000 students was broken up in the Boulevard St Germain by riot police using truncheons and tear gas grenades. Barricades were set up by demonstrators in nearby streets and both police and students were injured in the ensuing scuffles.

During the march, a number of students armed with iron bars and paving stones did extensive damage to banks and department stores.

The demonstration, the second in two days, was aimed against Government plans to reform the second cycle of university studies (third and fourth years). Drawn up by the former Secretary of State for Universities, M. Jean-Pierre Solson, and recently ratified by his successor, Mme Alice Saunier-Seïte, the reform aims to establish closer links between universities and local and national industry.

Students fear, however, that the new system of official validation of university courses will entail de facto selection, lower university

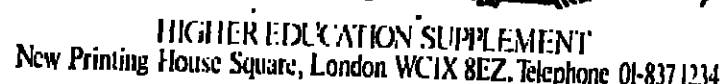
standards and lead to a university "league table". At present the 75 French universities are open to all baccalaureate holders and all higher education diplomas are officially recognized as having equal status.

The protest movement, which began nearly three months ago, has been steadily gathering steam over the past six weeks and now on the eve of the spring vacation, students in 25 universities all over France are out on strike.

At Bordeaux the university is currently being occupied by demonstrators. In Clermont-Ferrand during a lock-in the dean of the faculty was recently held by 1,500 protesting students. At Lille, more than 3,000 students marched in protest against both the second cycle reform and high unemployment among diploma holders.

Following the demonstrations Mme Saunier-Seïte confirmed her determination to go ahead with the reform due to be implemented in October 1977. There could be no major changes at this stage, she said, although minor modifications might still be made, particularly in order to maintain the national status of university diplomas.

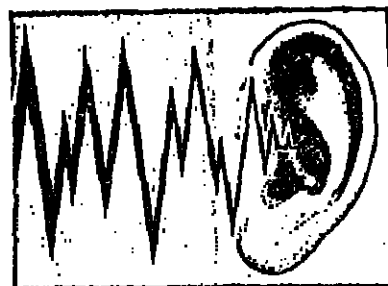
Earlier, Madame Saunier-Seïte threatened that all university examinations would be cancelled this year if the strikes and demonstrations persisted.



SUPPLEMENT

Tensors

... ..



A programme loved by gods and dons

Michael Stephens

Had it lived, the Third Programme would have become 30 years old in September this year. Loved by the gods, it died young; and there are those who believe it contracted a fatal disease. That, surely, was what a schoolmaster who achieved eminence in the management of BBC Radio in the 1960s implied when he caricatured the programme as an instrument for 'dons talking to dons'.

If only that had been the case, there would have been nothing inherently wrong: the potential national audience of dons, dons-aspirant, dons-embryo and dons-magnum was not, is not as minority audiences go, significantly small. And it was, after all, the Third Programme, anonymously justified by the existence already of a first (the Light) and a second (the Home) catering for the entertainment, informational and educational interests of larger and less academically-oriented audiences. What was

fatal was not so much the idea as the realization.

I remember early in the 1950s working with an Oxbridge don on a programme that mixed her own knowledge of, and insights into, the subject matter with long illustrated passages which he had selected from literary sources and which were voiced by a "professional" reader. In rehearsal, the speech styles and sounds of each jarred badly on the other, creating awkward tensions in the studio which necessitated postponing the recording. Eventually a better understanding was reached, renewed efforts were made, and a passable programme was broadcast.

When it was all over, the don remarked to me: "After this experience, I doubt if I shall ever lecture in quite the same way again". What she had perceived in the process of studio production was the partial relevance, at least, of the old dictum: "It's not what you say but the way you say it". It was the malignant spread of ineffective voice communication more than any other single factor that brought death to the Third.

Communication through disembodied human voices is a fundamental characteristic of radio broadcasting. Much of it these days, thanks to the tape-recorder and the telephone, is "natural" natural in the sense that what is said is largely occasioned by the moment, is a product of life-experience, conveys feeling as well as thought, and is usually said to someone who is there at the time—whether that someone is an on-the-spot interviewer or at the other end of the phone. Much of it, by the same token, is ephemeral and not for that reason necessarily insignificant.

Much of it, also, is "educative": many things can be learnt from the existence already of a first (the Light) and a second (the Home) catering for the entertainment, informational and educational interests of larger and less academically-oriented audiences. What was

continuing close relationship with academics in several countries in order to solve design problems and offer greater flexibility to the user. After designing a modular laboratory, the first Tandberg language teaching systems were installed in the United Kingdom in 1963, many of which are still in daily use.

The introduction of semiconductor devices had a dramatic effect on the electronics industry. Fully remote control systems, using solid state circuitry, gave the Shipton laboratory an enviable lead over its competitors. In 1969 Tandberg was able to answer the challenge with the 158 remote control system using for the first time a purpose designed student tape recorder. This laboratory has been continuously improved and developed in the past seven years.

The compact cassette as part of a language laboratory was first marketed by Aveley & Cyborox, unfortunately early testing troubles convinced educationalists that open reel systems were more reliable. At that time Tandberg was designing a cassette drive system and in 1974 announced the three motor dual capstan closed loop system using a specially designed student tape recorder, with the same drive system as the Tandberg TCD300 stereo deck, thousands of which had been sold to the world market and found to be trouble free.

Space travel resulted in the demand for smaller electronic components and language laboratory designers were not slow to produce digital control systems. Tandberg, in close cooperation with educationalists, produced the current 158 digital control laboratory, a flexible

BBC's educational broadcasting service is directed to audiences that are, statutorily or voluntarily, institutionalized as students—whether more formally in schools and colleges or more informally in the Open University—may temper the need for maximum attention on the production line to the essential communicability of the messages. But student-tolerance and teacher-support ought not to detract from the sophistication of effort required to ensure that programmes make an effective direct impact at the time on the individual learner.

The Russell Committee on Adult Education considered that, "None of the other agencies with which we are concerned is ever likely to rival the ability of broadcasting to make education available to people who cannot or will not have recourse to it outside the home". To make available is one thing, but to make effective is another. Educational broadcasts on radio depend for their effect just as much on the quality of the intercommunication they achieve as does any other kind of word-based broadcast. Again, because radio communication is private act performed in public, the speaker may be more preoccupied with possible exposure to the criticism of his peers than with the connection, person to person, that he must establish with his individual listeners if learning is to ensue: his self-assurance or self-doubt at the moment of broadcasting will similarly register in the sounds he makes.

The partnerships that are established between producers and contributors in the making of programmes are very much coloured by such issues. They do not always succeed, but if they do not, death is more likely to have occurred from heart-failure or loss of nerve than from a rush of blood to the head.

Michael Stephens is head of further education radio, The BBC.

When a squeak and a thump mean 'hello'

H. Bennett-Clark

Many of the bodily functions of animals are naturally noisy. The wingbeat of a bird makes a creaking and whistling—both of which an owl avoids by special design of wings and feathers—and the foot-fall of a mammal makes a rattling which the thump of a rabbit exploits to warn others of the approach of the softly padding dog.

The function of many sounds is social. Just as a blackbird sings to proclaim its presence and to indicate the boundaries of its territory, so a cricket or grasshopper will walk and sing in its patch of grass. The song of a blackbird is as unmistakable as that of a cricket, but, while that of a bird is partly inherited and is refined by hearing the songs of others, the song of insects is innate and little modified by any perceptual process.

Since the songs tend to be specific and there is only a limited audible spectrum, song context and timing become as important as the song itself; two closely related species of insects, mole crickets, may strutting to start their fight at the same time on a spring evening, and thus require different songs but the grasshopper warbler, a bird, can produce a song that is confusingly like that of one of the mole crickets, but does so during the day.



The leaf-nosed bat which calls through its nostrils

Confusion is biologically important only if species are so closely related that they might meet, mate and produce sterile offspring and so the evolution of a distinct song provides an isolating mechanism that maintains the integrity of the species.

Songs appear as an important part of the sexual behaviour and courtship of many land animals. Not only does the song vary from species to species within a group but the complexity of the song tends to reflect the complexity of the problem of species recognition. The deathwatch beetle can proclaim its presence by a simple tap with its head on wood but a grasshopper, sharing a field with many related species, produces an elaborate song which lasts many seconds and is composed of a progression of phrases containing a succession of different pulses.

In such insects, the character of the song depends on the context and excitement of the insect; while the courtship song of a courting cricket is relatively quiet and consists of brief chirps, the presence of another male leads to a higher activation of the same mechanism and a loud continuous trill of aggression.

In mammals, the sounds produced by newly born young indicate cold, hunger or distress to the mother—in man these sounds are pitched high at the most sensitive region of our hearing but in mice,

smaller and sensitive to higher frequencies, the distress calls of young are pitched above the range of our hearing.

High frequency calls are made by bats and whales for another purpose. Because the wavelength of sound varies as the inverse of its pitch, a high pitched sound of a wavelength is reflected by small objects. At 100,000 cycles per second, the wavelength is 3mm, tiny flies thus reflect a sound echo-soundable at least to bats to use this to catch their airborne prey at night.

The bat has many problems to be effective, the sound pulses must be loud and very brief, the larynxes have some of the fast muscles in the animal kingdom. Since the bat and prey are moving the pitch of the returning echo sound, and while this gives information of relative speed, its estimation requires that the loud pulse be detected from the returning echo which should be a tuned. This insect, if it is a bat, may hear the bat and its approaches crash dive or series of squeaks to jam the echolocation.

In some cases, recordings made for military purposes have been unexpected, and in some cases explained. Early attempts to use underwater listening devices to detect submarines were set against a background of the cracking sounds used by fish. Recent records made in the Atlantic have shown that humpback whales produce a long, complex highly individual and musical sequence during the course of their migration between the poles.

An understanding of acoustics is important in understanding the communication of small animals. A sound wave is two components, the pressure wave up as an object vibrates and the displacement caused by its movement. Far from it sound waves there is an advantage in liquids to the pressure changes in a wave; the delicate membrane of pressure ear can be protected by skeleton while the displacement requires an exposed valve. With small sound sources the displacement component becomes less than the pressure component due to the source and in this region displacement ear, such as the tentacle antenna of small sea animals, is greatly advantaged because the loudness falls rapidly with distance from the source offers great privacy.

This system is used by a fish insect to monitor its wingbeat by courting fruit flies to connect in a similar acoustic region, to use the displacement in the ear to detect moving insects on its surface or worms wriggling on its bottom.

From this type of evidence we can get some idea of the possible origins of acoustic communication in various animal tasks should be noisy and that it may be advantageous to be able to hear them. The frequency of the sound should tend to be higher in small animals because the resonant frequencies of the structures are smaller but since the receptor will be smaller, the two are coadapted.

The evolution of acoustic behaviour can similarly be explained. In the aggressive song of a cricket which is produced by rapid wing movements it would appear that the aggressor is starting to fly to the attack and in courtship song to fly towards its mate. With alarm calls of birds, the sound which takes its origin in rapid exhalation of breath during escape becomes the loudest scream of fear or pain and it is not surprising that this is widely heard and recognized.

Henry Bennett-Clark is lecturer in zoology at Edinburgh University.

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After the booths and jargon

John Farnell

The evolution of the language laboratory in the late 1950s attracted the attention of many electronics companies who were soon competing for a share of this lucrative market.

The academic world was inundated with sales brochures about tape recorders in booths connected to master consoles, all offering a guarantee to solve any language teaching problem by sending to tape recorders speaking fluent French, German, and other languages, respectively. To compare the merits of these various systems, academics were required to learn the technical jargon of the tape recording world. "Wow, starter and signal to noise" became a form of technical oneness in linguistic circles.

However, a large proportion of the companies departed after making quick profits leaving behind an unfortunate legacy for recipients of their wares: domestic tape recorders totally unsuited for the job and a bewildering array of controls which baffled the would-be linguist and tutor alike, and an inadequate after sales service.

Tandberg's policy towards language laboratory development has from the start been based on a

continuing close relationship with academics in several countries in order to solve design problems and offer greater flexibility to the user. After designing a modular laboratory, the first Tandberg language teaching systems were installed in the United Kingdom in 1963, many of which are still in daily use.

The introduction of semiconductor devices had a dramatic effect on the electronics industry. Fully remote control systems, using solid state circuitry, gave the Shipton laboratory an enviable lead over its competitors. In 1969 Tandberg was able to answer the challenge with the 158 remote control system using for the first time a purpose designed student tape recorder. This laboratory has been continuously improved and developed in the past seven years.

The compact cassette as part of a language laboratory was first marketed by Aveley & Cyborox, unfortunately early testing troubles convinced educationalists that open reel systems were more reliable. At that time Tandberg was designing a cassette drive system and in 1974 announced the three motor dual capstan closed loop system using a specially designed student tape recorder, with the same drive system as the Tandberg TCD300 stereo deck, thousands of which had been sold to the world market and found to be trouble free.

Space travel resulted in the demand for smaller electronic components and language laboratory designers were not slow to produce digital control systems. Tandberg, in close cooperation with educationalists, produced the current 158 digital control laboratory, a flexible

system, simple to use, giving the teacher freedom to concentrate on teaching problems, and at the same time making more exacting specialist requirements by adding modules.

Since the oil crisis the demand for language laboratories in the United Kingdom has steadily fallen, inflation, cuts in government spending and school building programmes have reduced demand, but in spite of this Tandberg has managed to increase its share of the market for language laboratory installations. The company's strength lies in being able to meet the changing demands for hybrid teaching systems tailored to available financial resources, group trainers, mono tape recorders, audio active and comparative laboratories backed by expert advice and after sales services.

Tandberg's parent company in Oslo continues to expand its worldwide activities especially in the developing countries; Saudi Arabia alone requires over 100 language laboratories in the next three years. The educational department in Oslo using computer-aided design and design concepts in circuitry are working to reduce the cost of future teaching systems and plan to market a "stand alone" computer for use in schools.

Replacement of obsolete equipment in higher education establishments is going ahead in spite of a shortage of money, and many universities and colleges are purchasing cassette systems.

John Farnell is managing director of Tandberg (UK) Ltd.

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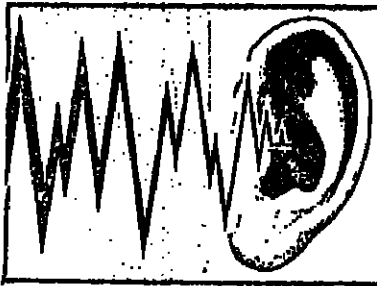
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Anything for a quiet life

J. B. Large

Noise plays an increasingly important and uncomfortable role in our daily lives. No one really knows how much the general level of man-made noise is increasing but there is no doubt that most of the population is exposed to noise levels which can cause distress or even physiological damage.

Exposure to high noise levels experienced in many industrial situations over a working lifetime can lead to deafness. This industrial hazard is now well recognized both in Europe and in other parts of the world. There are a variety of documents illustrating the effect of continual noise exposure, together with advice on how to minimize this effect in various work situations. Some countries have legal statutes which demand a hazard-free environment for the worker; in this way, the aid of scientific guidelines, use the power of legislation to enforce control. The United Kingdom falls into the latter category.

But for the majority, noise exposure consists of daily contact with the sounds of transportation, traffic, rail and aircraft, together with a steady exposure to different sources of noise both at work and in the home.

The total noise dosage may not add up to that experienced by a worker in heavy industry, but it is sufficient for a number of prominent research workers to believe that even at these levels a hearing loss occurs over a lifetime of exposure.

It has long been recognized that hearing deteriorates with age, a condition described as presbycusis, but it has only recently been recognized that different societies produce different patterns of hearing loss. For example, in populations removed from most of man-made noise, hearing loss with age is less than for those of us who live in urban areas.

The most quoted example of this effect comes from the results of a study to compare the hearing

characteristics of the male population from a remote tribe in southern Sudan with males in the United States. The results showed a significant decrease in hearing ability with age for the American population sampled compared with their African counterparts.

The evidence is, again, tenuous but has given rise to the term "sociocusis", a hearing loss induced as a consequence of a particular life style. In the United States this health detriment has been taken as the cornerstone of environmental noise control with the ultimate goal of protecting over 90 per cent of the population from a noise exposure which could induce an unnatural loss of hearing.

A somewhat different philosophy is pursued in this country where



Noise causes distress.

human response to the noise environment is related to a subjective reaction; in this case it is usually described as annoyance. In this way, relationships have been developed between annoyance and the physical noise exposure produced by traffic, aircraft, railways, industrial and highway, and other forms of construction.

The word, annoyance, at first glance appears to be a rather unscientific term, but in the English language it conveys a fairly accurate description of some physical condition which disturbs one's normal activities. In 1961, the pioneering report produced a relationship between the percentage of population highly annoyed by aircraft noise and the physical noise exposure.

The Heathrow study has set the pattern for a variety of surveys of annoyance factors but can be determined from these surveys.

The first is that a strong relationship exists between growth response and the noise; i.e. the population on average becomes more annoyed as noise exposure increases. However, there is a great range in response levels on either side of this central tendency which is due to individual reactions. Specifically, at levels of noise exposure which, on the average, a community may

not find annoying, there could be at least 10 per cent of the population still highly annoyed.

The second important factor is that when looking at an individual's response to noise, the actual physical noise exposure is only one of a number of items which plays a role in describing their annoyance. For instance, aircraft noise triggers a range of attitudes among which fear of aircraft crashes appears to be the most important. Social class usually coupled with the respondent's economic status also enters into the complete equation.

This array of influencing factors complicates the administrator's job when charged with setting suitable environmental standards of noise. Even so, he recognizes that different types of noise evoke different levels of annoyance at the same physical exposure level, for example, railway noise may be less annoying than aircraft noise, the decision-maker knows that any attempt to counter noise down to low levels will always leave a residue of the population unsatisfied.

This type of situation is difficult to prove but a current research programme in this country is attempting to discover if higher incidence of mental disorder occurs in the population around Heathrow airport than in communities away from aircraft noise.

Two Japanese research workers claim fetal development can be inhibited in women exposed to high levels of aircraft noise. A Dutch worker has linked coronary disease to this source of noise. Although the current evidence will not stand up to careful, scientific scrutiny, the possibility that chronic effects exist must not be ruled out.

There are more objective ways of estimating the effect of noise on people and that is to specify levels of exposure which enable such functions as a domestic conversation, television viewing, lecturing or tutoring. In these situations, noise levels can be specified to enable each of these activities to function effectively.

However, where attempts to do this for other important human situations, such as rest and relaxation or interference with sleep are made, then it becomes more difficult to specify the levels because individual life styles are a feature of these events, and must be taken into account in the development of criteria.

In spite of the complexities of the problem, great strides have been made in the past 15 years in our understanding of the effects of noise on people. The control of noise is now taken as a serious objective by national governments as well as by supra-national bodies, such as the European Economic Community and the World Health Organization, and there is every hope that the future will be quieter.

Professor J. B. Large is professor of applied acoustics in the Institute of Sound and Vibration of the University of Southampton.

Sounding out pregnancy

R. W. Taylor

Sound waves of a greater frequency than 16000 Hertz (Hz) are inaudible and are known as ultrasound. Very high frequency waves can be produced and in medical practice it is common to employ frequencies of 1-2 million Hz. Audible sound radiates from its source in a circular fashion but very high frequency sound can be directed like a beam of light.

It can be reflected, refracted or absorbed. It can be passed through the body although it is attenuated according to the characteristics of the tissues it meets. Different tissues have their own "specific" of ultrasound passing through several different tissue layers will be dealt within each layer in a different way.

The beam is reflected from the interface between tissues of different acoustic impedance. The greater the difference between the tissues the clearer the demarcation becomes. A solid-liquid interface, for example, is most notably distinct, and fluid-containing bodies such as the bladder and the pregnant uterus can be outlined very clearly.

The ultrasound beam is attenuated very markedly by air and some means of excluding air from the pathway of the beam has to be found. In practice the most important layer of air is between the source of the ultrasound waves and the body surface and exclusion is achieved by applying a layer of oil or soluble jelly to the skin, ensuring the probe emitting the waves in this substance.

In clinical practice, a pulsed beam of sound is employed. Usually a pulse is employed at a rate of 300 per second. This means that in an hour's use, there will be only two seconds during which sound will actually be passing through tissues.

Essentially a diagnostic ultrasound apparatus consists of a device for producing a pulsed ultrasound beam, a means of directing the beam at will, a device for picking up the echo waves and displaying or recording them. There are two modes of display. "A" scan in which the reflected pulse is recorded as a vertical deflection and "B" scan in which the pulse is represented as a dot corresponding to the position of the echo. By moving the source of the beam many tissue interfaces can be crossed and by retaining the individual echoes a picture can be built up on a cathode ray tube.

The first machines produced such "echograms" in black and white

but modern apparatus can produce pictures up to 16 shades of grey between these extremes. The texture of the tissue through which the ultrasound is passed. This has made it a much more useful tool.

The full potential of ultrasound is by no means yet realized. Its use in obstetrics and gynaecology has been exploited. Introduced in 1958 by Ian Donald in Glasgow and his enthusiasm must go much of its value.

It is also true that diagnostic ultrasound was discovered about the time when the growing focus was on safety. Ultrasound seemed likely to be safer than X-ray and it has been taken its place in investigation of foetal and placental conditions.

It can be employed to detect the number and position of baby or babies within the womb. It can be used to detect some defects of the skull and the bladder and some limb defects.

One of the important uses to determine the position of placentae, particularly in those circumstances where it is situated or where it separates the uterine wall and chorionic ridge before delivery.

The pulse rate of the blood vessel or in the heart can be detected, and by using an apparatus the beat of the heart can be translated into a recorded visually. We can record the heart beat of the baby as early as the third month of pregnancy and in the third trimester of pregnancy.

However it is in the use of sound techniques to measure foetus accurately that the greatest benefit has been obtained. Foetal skull can be measured, the length of the trunk determined. Other measurements such as transverse diameter can be made with greater difficulty and ability of knowing the size of baby's head is obvious in a where there might be a disproportion between it and the maternal pelvis, or if the leading part of the baby is breech.

Furthermore, there is a close relationship between the size of the foetal skull and the state of gestation, especially if measurements are made in the middle three months of pregnancy. As the length of gestation is the only accurate measure of the time of gestation, it is of great importance to determine gestational age.

Probably the most important use of skull measurement is in the assessment of the growth rate of a baby. We now know that the uterine growth retardation has a permanent effect upon physical and mental development of the child.

Early detection of the best chance of avoiding its consequences. The regular measurement of babies thought to be at special risk is invaluable in this respect.

It is diagnostic ultrasound is recommended to pregnant women it must be safe. Many experiments have been done in laboratory conditions on cell cultures and on the foetuses of animals showing any evidence that damage can be caused. Surveys carried out on the development of children subject to ultrasound during gestation are also reassuring in that dangers have been shown.

It did however take us some years before we realized that X-ray the foetus in utero could be dangerous and it would be foolish not to continue to use this special tool with circumspection.

In gynaecology ultrasound is sometimes employed in the investigation of cysts of the ovary, abnormally situated pregnancy, threatened abortion and the peculiar abnormality of the placenta known as hydatidiform mole.

Physicians and surgeons may use it to investigate tumours, particularly of the liver and kidney while the urologist makes use of the fact that the brain has two large fluid filled cavities to investigate intracranial abnormalities. The potential of ultrasound, particularly with the recent development of apparatus, must lie in all these areas and other important advances can be expected.

Professor R. W. Taylor is professor of obstetrics and gynaecology at Temple Hospital, London.

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JP 10/10/76

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Applications are invited for the following positions:
LECTURER IN AGRICULTURE
The Department of Agriculture is seeking a Lecturer in Agriculture to join the staff. The successful candidate will be responsible for teaching and research in the field of agriculture. The position is full-time and requires a minimum of five years' experience. The salary is £12,000 per annum. Applications should be sent to the Department of Agriculture, Massey University, Palmerston North, New Zealand.

NEW ZEALAND
MASSEY UNIVERSITY
Palmerston North
Applications are invited for the following positions:
LECTURER IN VETERINARY MEDICINE
The Department of Veterinary Medicine is seeking a Lecturer in Veterinary Medicine to join the staff. The successful candidate will be responsible for teaching and research in the field of veterinary medicine. The position is full-time and requires a minimum of five years' experience. The salary is £12,000 per annum. Applications should be sent to the Department of Veterinary Medicine, Massey University, Palmerston North, New Zealand.

Bournemouth College of Technology
Faculty of Tourism, Catering and Hotel Administration
LECTURER GRADE II/SENIOR LECTURER
in ACCOMMODATION OPERATIONS
for the new Dorset Institute of Higher Education
at Wallisdown, Bournemouth
To be responsible for teaching and development of accommodation operations for HND and HCAIA Courses.
Date of Appointment: 1st September 1976.
Salary: Within the Lecturer II/Senior Lecturer Scale of:
£12,000-£25,000 (Senior Lecturer)
Further details and application forms may be obtained from: The Principal, College of Technology, Lansdowne, Bournemouth BH1 3JL. Tel.: (0202) 5064.

Polytechnics
ABERDEEN
ROBERT GORDON'S
INSTITUTE OF
TECHNOLOGY
SCHOOL OF BUSINESS MANAGEMENT STUDIES
LECTURER-(a) Accounting
(b) Personnel Administration
(Manpower Development)
Qualifications: Post (a) Full professional membership of a major accounting body essential. Relevant U.K. University of C.N.A.A. degree desirable. Post (b) Relevant U.K. University or C.N.A.A. degree essential. Professional or postgraduate training desirable.
Experience: Minimum of five years' industrial/commercial experience. Lecturing or research an added recommendation. Post (b) to include responsibility for an aspect of training and development.
Duties: Participate in the operation and development of appropriate courses at degree, postgraduate/post experience levels.
Salary: £23,210-£28,495 per annum.
Location: Aberdeen—Assistance with removal expenses.
Details and application form from the Chief Administrative Officer, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen AB9 1PR.

NEWCASTLE UPON TYNE
POLYTECHNIC
Department of Nursing and Welfare Studies
PRINCIPAL LECTURER
Required in the Division of Social Work. Applicants should hold a degree in one of the social sciences and should also be professionally qualified social workers with experience in student teaching/training in the areas of field and residential social work. Particular responsibilities are the leadership and management of the teaching activity of the Social Work Division.
Burnham F.E. Principal Lecturer £5,940-£6,642 (bar) £7,578.
For further particulars and application forms, returnable by Monday, 5th April, 1976, please send stamped, addressed envelope to: Staffing Officer, Newcastle upon Tyne Polytechnic, Ellison Buildings, Ellison Place, Newcastle upon Tyne NE1 8ST.

ABERDEEN
ROBERT GORDON'S
INSTITUTE OF
TECHNOLOGY
SCHOOL OF BUSINESS MANAGEMENT STUDIES
LECTURER-(a) Accounting
(b) Personnel Administration
(Manpower Development)
Qualifications: Post (a) Full professional membership of a major accounting body essential. Relevant U.K. University of C.N.A.A. degree desirable. Post (b) Relevant U.K. University or C.N.A.A. degree essential. Professional or postgraduate training desirable.
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Location: Aberdeen—Assistance with removal expenses.
Details and application form from the Chief Administrative Officer, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen AB9 1PR.

dundee college of technology
Applications are invited for the post of
HEAD OF DEPARTMENT OF
MOLECULAR & LIFE SCIENCES
The college is a Scottish Central Institution with a substantial and developing range of courses at degree and diploma level. The Department of Molecular & Life Sciences offers a wide range of courses including a degree in Nursing, B.Sc. in Biology and B.Sc. in Chemistry. The successful candidate will be responsible for the development of the department and will be expected to contribute to the college's research and development activities. The salary is £12,000 per annum. Applications should be sent to the Department of Molecular & Life Sciences, Dundee College of Technology, Dundee, Scotland.

ABERDEEN
ROBERT GORDON'S
INSTITUTE OF
TECHNOLOGY
SCHOOL OF BUSINESS MANAGEMENT STUDIES
LECTURER
Banking and Finance
Qualifications: Relevant U.K. University or C.N.A.A. degree essential. Professional membership of the Institute of Bankers or major accounting body desirable.
Experience: Minimum five years' banking or commercial experience. Lecturing or research an added recommendation.
Duties: Participate in the operation and development of appropriate courses at degree, postgraduate/post experience levels.
Salary: £23,210-£28,495 per annum.
Assistance with removal expenses.
Details from Chief Administrative Officer, Robert Gordon's Institute of Technology, Schoolhill, Aberdeen, AB9 1PR.

Leicester Polytechnic
PROFESSOR
of Computer Science
and Head of the School of
Mathematics, Computing
& Statistics
Applications are invited for the Chair of Computer Science vacant 1 September 1976. The appointee will be expected to develop further teaching, research, applications of computing throughout the Polytechnic and liaison with F.E. Institutions.
Salary: £8,937 - £9,913 p.a.
Further particulars and application form from Staffing Officer, Leicester Polytechnic, P.O. Box 143, Leicester, LE1 9BH.
Applications close on 30 April, 1976.

LANCASTER
THE POLYTECHNIC
Applications are invited for the following positions:
FACULTY OF SOCIAL SCIENCES
LECTURER Grade II in ACCOUNTANCY AND FINANCE
LECTURER Grade II in BUSINESS POLICY
LECTURER Grade II in POLITICAL SCIENCE
Salary: Senior Lecturer Grade II £23,210 to £28,495 per annum. Lecturer Grade II £12,000 to £17,190 per annum. Commensurate salary for the above posts may be above the above scale.
For further particulars and application forms, please apply to the Staffing Officer, Lancaster Polytechnic, Bailrigg, Lancaster, LA1 4YW. Tel: 0525 3411.

BRADFORD COLLEGE
Applications are invited from suitably qualified persons for the post of
SENIOR LECTURER
in
EARLY CHILDHOOD EDUCATION
The School of Education, Bradford College, is seeking a Senior Lecturer in Early Childhood Education. The successful candidate will be responsible for teaching and research in the field of early childhood education. The position is full-time and requires a minimum of five years' experience. The salary is £12,000 per annum. Applications should be sent to the Department of Education, Bradford College, Bradford, West Yorkshire.

WESTMINSTER COLLEGE, OXFORD
HEAD OF EDUCATIONAL STUDIES DEPARTMENT
Grade V
(£7,659 by 4 increments to £8,500)
(Re-advertisement)
SEPTEMBER, 1976 or JANUARY, 1977
This is a new post which has arisen as a result of internal reorganisation. The college is at present planning submission for B.E.D. degree courses to C.N.A.A.
The successful applicant will have oversight of work done in the areas of academic education, professional studies and school practice for degree and postgraduate students. It is expected that the person appointed will have good academic qualifications together with suitable experience, and will be able to contribute to the teaching of one of the Educational disciplines.
Further particulars may be obtained from the Principal, Westminster College, North Hinksey, Oxford OX2 9AT.
This closing date for applications is Saturday, April 17 1976.

ABERDEEN
ROBERT GORDON'S
INSTITUTE OF
TECHNOLOGY
SCHOOL OF BUSINESS MANAGEMENT STUDIES
LECTURER
Banking and Finance
Qualifications: Relevant U.K. University or C.N.A.A. degree essential. Professional membership of the Institute of Bankers or major accounting body desirable.
Experience: Minimum five years' banking or commercial experience. Lecturing or research an added recommendation.
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This closing date for applications is Saturday, April 17 1976.

Overseas

The British Council
invites applications for the following
POSTS IN GHANA
Applicants for all posts must have a British educational background with an appropriate degree and teaching qualification.

SCHOOLS
Head of Mathematics Department 76 HT 59
Head of Physics Department 76 HS 60
Sixth Form Science College, Legon
5 years' relevant teaching experience essential.
Salary: £4,251-£5,268 p.a.
Head of Mathematics Department 76 HT 52
Head of Science Department 76 HS 61
Mantinsian Girls' Secondary School, Saltpond
5 years' relevant teaching experience, 2 years as Head of Department, essential.
Salary: £3,468-£4,563 p.a.
Head of Chemistry Department 76 HS 63
Tamale Secondary School, Tamale
3 years' relevant teaching experience essential.
Salary: £4,251-£5,268 p.a.

TEACHER TRAINING COLLEGE
Senior Lecturer in Mathematics (Head of Department) 74 MT 14
Senior Lecturer in Science (Head of Department) 76 HT 1
Wesley College, Kumasi
To teach students training as junior secondary school teachers.
5 years' relevant teaching experience essential.
Preferred age 28-55 years.
Salary: £4,395-£5,408 p.a.

Contracts are for 4 years (shorter periods may be possible) and are guaranteed by the British Council. They include the following benefits: return passage for the teacher and family; free accommodation; overseas allowances; allowances for children and boarding school fees; fares for children's holiday visits; outfit and baggage allowances; assistance with duty and freight on imported car; paid terminal leave.
Please write, briefly stating qualifications and length of appropriate experience, quote relevant reference number(s) for further details and an application form to The British Council (Appointments), 65 Davies Street, London, W1V 2AA.

MOROCCO
Ministry of Higher Education
MOHAMMED V UNIVERSITY
Faculty of Arts, English Department, Rabat
Senior Lectureships for Academic year 1976/77
English Literature 1 post
Theoretical and Applied Linguistics 1 post
English as a Foreign Language and British Life and Institutions 2 posts
P.H.D. with teaching experience.
Salary: 4,200-4,900 dirhams monthly (at present approx. £5,930-£6,920 p.a.).
Fares from and to London for Lecturers and family.
Annual contracts, renewable. Fringe benefits.
Low income-tax.
Interviews in London during April/May.
Apply direct by AIR MAIL to Dean of the Faculty of Letters, University Mohammed V, Rabat, Morocco, with curriculum vitae and the names and addresses of two referees in Britain. (No retired applicants.)